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ORIGINAL ARTICLES.

EXPLANATION AND DEMONSTRATION OF THE INFILTRATION (SCHLEICH) METHOD OF ANESTHESIA—PRELIMINARY PAPER—WITH TEN ILLUSTRATIONS.

Read before the Milwaukee Medical Society, Nov. 27, 1894.

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[Your attention is invited to a subject which from the humanitarian standpoint is of the greatest importance and of practical value to us as surgeons. Much of the effort of our profession is directed toward the relief or prevention of pain. Distinct advances in our art followed the introduction of the various narcotics, and the science of surgery took a long step forward when the use of sulphuric ether for anesthesia was discovered Sept. 30, 1846, by Dr. Wm. T. G. Morton, of Wellesley, Mass., and chloroform by Sir James Simpson, of Edinburgh, on Nov. 4, 1847; and these names will ever live in our memory.

But the great boon of narcosis is not unalloyed. Thousands have died from the effects of the volatile anesthetics, and every time we administer them we take upon ourselves the responsibility of a human life. Ether kills once in 15,000 administrations; chloroform once in 3,000.[1] In November, 1894, Dr. Karl Koller, a student in Arlt's clinic of Vienna, first demonstrated the practical value of cocain,[2] and we hailed with gladness the promises made by subsequent investigators that the hypodermatic injection of this remedy would do away with the administration of ether or chloroform for all external surgery at least. The cases of intoxication and the fatalities attendant upon the hypodermatic injection of this drug have so discredited the method that many of its former advocates have practically given it up. A personal experience of several hundred cases has been unattended by fatalities although it has not been entirely satisfactory. Administered in this manner it is even four times as fatal as chloroform.

The local anesthesia produced by the application of this drug in ophthalmic and nasal surgery has revolutionized these branches and will probably never be superseded by other modes. The freezing methods are applicable to but a limited number of surface operations, and the plastic healing is not always so good as is desirable. The application of ether, ethylchlorid or rhigolene in spray is somewhat painful and their effect is evanescent. Dread of the pain to be inflicted by the surgeon's knife or of the dangers attendant upon general narcosis or cocain injection keeps many a patient from a necessary operation until absolutely forced to consult a surgeon; as we daily have occasion to observe, he frequently waits so long that a primarily minor affair needs at last a formidable operation.

Within the last year the results of experiments and operations done in Germany have developed the surprising fact that endermatic injections and infiltration of the various tissues of the human body with water alone or with solutions of indifferent substances afford a practical anesthesia. In the early part of this year my friend, Dr. Casey A. Wood, of Chicago, called my attention to a letter he had received from Dr. Cholewa, of Berlin, who was enthusiastic over a new method of anesthesia, and had been personally operated upon by its discoverer, Dr. Schleich, who had then done 521 operations. Shortly afterward Dr. Wood published portions of this letter in the form of an article in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, May 26, 1894;[3] but as the directions therein were not explicit it has apparently not yet been used in this country.

In July, 1894, at the German Congress of Surgeons, Schleich presented the results of his labors (some three thousand operations) which shortly afterward appeared in book form. I ran across this monograph on "Schmerzlose Operationen,"[4] and with some little diffidence began his line of experiments, the results of which I will detail later. The opportunities afforded me in special practice are not sufficiently great to permit of the corroboration of all his statements as regards general surgical procedures, so I bring the subject before you in the hope that you will try it in your work and further develop the usefulness of the method.

Schleich presents his claims so well that I have concluded to give them in the form of a translation, from parts of his brochure, which I am enabled to afford you by the aid of Dr. Gustave Kaumheimer and which I have abridged for the purposes of this article.]

WHAT DO WE UNDERSTAND BY "INFILTRATION" AND "ARTIFICIAL" EDEMA?

"Liebriech's experiments in the production of local anesthesia have proven that subcutaneous injections of various substances will produce a loss of conduction of the sensitive nerves after a transient irritation, without allowing us to class them as anesthetics in the sense of producing a regional, purely narcotic and local anesthesia. In spite of the fact that anesthesia could be produced by destruction, colliquation, necrosis, or corrosion of the tissues infiltrated by chemically active substances, the prodromal pain was such that nobody conceived the idea of using this method for practical use in anesthesia. The greater number of these experiments was made subcutaneously on the skin and mucous membranes of animals. The problems to be unriddled were, however, of such a nature that only experiments on man would solve them, although Liebriech strongly discountenanced such trials by one of his pupils. In fact, one such experiment (with ammonia) was attended by dire effects.

"In order to obtain positive results in the production of physiologic anesthesia, which could only be procured by injection experiments upon man, I (Schleich) tried them upon myself and my assistants. First of all we had to abandon the method (usually followed in cocain injections—H.V.W.) of obtaining regional anesthesia by formation of a depot in the subcutaneous tissue, and having the effect carried thence outward to the cutis and inward to the deeper tissues. The subcutaneous cellular tissue is of itself not very sensitive and there was the possibility that the drug employed acted as an anesthetic without this action spreading along the nerve trunks. We might have subcutaneous without cutaneous anesthesia. Consequently we chose our own skin for the trials, particularly the very sensitive portion of the left fore-arm. I am greatly indebted to my colleagues for freely granted opportunities to repeat and

NOTE.—The illustrations accompanying this article are reproduced from Schleich's "Schmerzlose Operationen."

1 H. C. Wood, Therapeutics, 1888.

2 Wien. Med. Wochenschr. Nov. 1884.

3 Cholewa, on "Local Anesthesia Produced by Intra-cutaneous Injections," JOURNAL AMERICAN MEDICAL ASSOCIATION, May 26, 1894.

4 "Schleich Schmerzlose Operationen," Berlin, 1894.

verify my results upon their arms. We first tested the sensibility of an endermatic wheal produced by the injection of a few drops of fluid.

"If we inserted a Pravaz needle flatly under the epidermis, so to speak under the papillæ, and pass it intra-cutaneously until the lumen is fully inserted and then inject a few drops, we produce a white, strongly elevated wheal. (See Figs. 1 and 2.)

"This wheal, which can be increased in extent as far as we wish by renewed punctures within the raised area, is the test object for the anesthesia, paresthesia and hyperesthesia which may be produced by the contact of the fluid. By means of these wheals, we are able to measure exactly the alteration of sensibility produced. This manner of testing has the advantage that we are able to transfer the results obtained to all other tissues, as the skin, with its highly developed sensory organs furnishes a field for particularly accurate observations. The results were certainly applicable to other tissues, as the periosteum, fascias, muscles, the mucous and serous membranes.

"Our first attempt was to determine the lower limit of activity of cocain, as it was desirable to be able to dilute the usual 4 per cent. to 5 per cent. solutions without abolishing the anesthetic action. As with solutions of 5 per cent. we would administer the maximum dose in one to five syringes full we would be compelled to exceed the maximum dose and

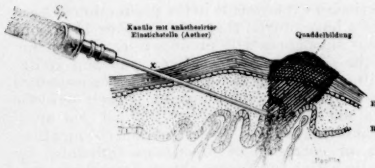


FIG. 1.—Diagram of a section of the skin, showing formation of the first wheal.

thus impress upon the method the objection of great danger, or restrict its use to a small number of trivial operations. The testing of the wheals by the use of cocain solutions below 1 per cent. gave the surprising result that *0.02 per cent. solutions produced a complete anesthesia of the infiltrated area without the production of pain during the injection.*[4A]

"Immediately beside the white raised wheal, which resembles a mosquito bite, complete sensibility with no reduction of sensation was found; 0.02 cocain to 100 parts aq. dest. is the weakest solution by which we can produce anesthesia without prodromal hyperesthesia. This infinitely small quantity of cocain (0.0002[4B] to a syringeful, 0.000.001 to a single puncture) suggested the use of distilled water. It was found that this produced quite severe pain during the formation of the wheal, but later caused *complete anesthesia throughout the extent of the infiltration.* This proved that aq. dest. belonged to the class of *anesthesia dolorosa*, as surmised by Liebriech from experiments on animals. Water causes the same phenomenon not only in animals, as stated by Liebriech, but also in men as we have seen. Practically, this was of no importance, as the pain of injection is so severe that it can hardly be controlled by accessory methods such as the use of the ether spray. (Deep injections of cold water have been used for several years in sciatica as a local anesthetic with alleged benefit.—H. V. W.) With the aid of the ether spray, I performed several small operations by this method, but my experiments soon took a different direction.

"We soon found that physiologic salt solution of 0.6 per cent. caused a wheal without changing the sensibility of the skin. *There was no pain during or after the injection but there was no anesthesia.* We surmised that between pure water and 0.6 per cent., NaCl solution we would find a concentration which would admit of painless infiltration and later on account of its resemblance to pure water produce anesthesia. In fact, an 0.2 per cent. solution of salt produces during infiltration but a very trivial feeling of tension, with perhaps a little itching (paresthesia) but after a short time the area of the wheal is anesthetic, as if the solution had contained cocain. This solution is a practical anesthetic, and by its use I excised from the neck of Dr. Bergmann a nævus of the size of a 50-cent piece and united the skin with five stitches without producing the least pain. This solution of 0.2 per cent. salt is the vehicle of all my anesthetic fluids. It is the essential new basis of my method. To my great surprise I found that the lower limit of activity of cocain (0.02 to 100) could be reduced one-half if the salt were dissolved in this solution and in this concentration (0.01 to 100) it was perfectly active. Further trials with stronger salt solutions (over 3 per cent. or 4 per cent., showed that such liquids caused considerable burning and even hyperesthesia in the infiltrated tissues. Even stronger solutions of cocain (4 per cent. to 5 per cent.) will produce burning at first, followed later by anesthesia.

"Thus we find for cocain as for salt, three distinct zones of activity. With salt we find that in a concentration of 0.2 per cent. very slight paresthesia with succeeding anesthesia is produced; a concentration of 0.6 per cent. produces neither paresthesia or anesthesia but in the strength of 3 per cent. or 4 per cent. it produces distinct paresthesia. With cocain we find that a solution containing 0.01 per cent. causes, at first, paresthesia and then anesthesia; one containing from .02 per cent to 2 per cent. is purely anesthetic, while above this its action resembles that of the *anesthetica dolorosa.* Similar results were obtained with numerous other remedies; thus morphin in the strength of 0.1 per cent. is an excellent pure anesthetic without paresthetic action. This, in spite of the dictum of the text-books that morphin has no local action, a statement which would not have been made if its endermatic action had been tried before. *In fact, the discovery of these truths, so valuable for the questions of local anesthesia, is due simply to a slight change of method, the application of the drug within and not under the skin.* In the strength of 1 to 1000 in water or 0.2 per cent. salt solution, morphin is a very useful anesthetic. Below this strength its action is irritative; in stronger solutions of 3 per cent. to 4 per cent. it causes burning and then anesthesia. Solutions of sugar (3 per cent.); bromid of potassium (3 per cent.); methyl-violet (1 per cent.) and caffein (2 per cent.) are also pure anesthetics; above and below this strength they have an irritative action on the nerve elements. Carbolic solutions of 0.2 per cent. to 1 per cent. have a purely anesthetic action within the wheals. Two per cent. to 5 per cent. solutions cause smarting. We are convinced that a number of other bodies will be found to have an anesthetic action and possibly future discoveries

[4A] In this abridged translation I have taken the liberty of italicising certain important statements.
[4B] Continental Pravaz syringe.

may have a great influence upon the method. However, the facts already demonstrated have enabled us to develop the method of local anesthesia to a considerable degree and to forever remove the objection of possible danger. With this achievement the method has reached a stage in which it enters into direct rivalry to general narcosis. The use of cocain, morphin, or carbolic acid in such great dilutions that a very large number of syringesful (100, 250, 500) would be required to reach the maximum dose permits us to perform extensive operations without using a dangerous quantity of these drugs. It is incontrovertibly proven that anesthesia can be produced by solutions of cocain of the proportion of 1 to 5 grams in 1 liter of water or of 1 to 5 grams in 10 liters of a two-tenths of 1 per cent. salt solution.

"*We must not lose sight of the cardinal fact that the anesthesia exists only within the area infiltrated by these solutions and that outside of that, normal sensation exists. So that our method rests mainly on the principle of a complete artificial edema of the field of operation.* The experimental facts teach us that the anesthetic action is not wholly due to the narcotic properties of the drug employed. The physiologic salt solution is too similar to the tissue juices to produce any alteration within the tissues. But a slight change in its concentration is needed to cause its anesthetic action. Even pathologic edema would produce anesthesia if instead of 0.6 per cent. it contained but 0.3 per cent. or 0.2 per cent. of salt. Conversely, by the use of 0.2 per cent. solution of salt I am able to produce an artificial edema which causes anesthesia of the edematous part. The variation of the quantity of salt contained in the liquid is not the only factor.

"Experiments have shown that in this and in all other anesthesias, other factors besides a chemic difference are at work. If the skin and cellular tissue be edematized under considerable pressure the entire area becomes ischemic. Not a drop of blood exudes from the cut surface. This of itself has a tendency to obtund sensibility. Besides this the tissues are under a much greater pressure than normally, by means of which a direct compression of the nervous elements is obtained. In the third place the difference in temperature, if the solution be of the temperature of the room, assists in reducing sensibility. All our dilute solutions lost their anesthetic power wholly or in part, at or above body heat, and showed decidedly increased activity when used cold. (0. degree Cent., or 32 degrees Fah.) To these predisposing and accessory factors the direct chemic alteration of the nerve elements by the narcotic drug is superadded.

"It has been asked why we use the narcotic drugs at all; why the 0.2 per cent. salt solution is not used alone, if it will produce anesthesia as we claim. The salt solution is sufficient for all those cases in which we operate wholly within healthy tissues, although this is but rarely the case in operation. We have always to deal with pathologic changes by which the normal sensibilities are more or less increased. Even if the one-third strength physiologic salt solution will cause anesthesia of normal tissues it will not do so in hyperesthetic areas. The tenderness is occasionally so intense over inflamed tissues that the symptoms evince the presence of mechanical pressure; anemia and difference in temperature will not suffice to abolish the increased nervous function. Here we require the direct coöperation of the narcotic poisons and for this reason I believe that it will be difficult to use physiologically-indifferent remedies alone. However, as I have proven that cocain, morphin and carbolic acid are active in solutions *which are several hundred times weaker than those in common use*, it is possible to keep the doses necessary for the compensation of hyperesthetic nervous action absolutely below the poisonous limit. The strongest solutions which are used, and then only in the severest cases, contain only 0.2 per cent. cocain and 0.025 per cent. morphin, so that fully thirty syringesful of this absolutely anesthetizing solution is the maximum dose. We will see, however, that (for any operation?) at most ten syringesful of this solution are required (doses of 0.02 and 0.01) and in a manner radically different from their administration in a single dose. We shall further see that hardly one-third of this liquid is absorbed and we will prove by the history of our cases that among three thousand patients operated upon, not one showed the least symptom of intoxication. For the most cases a solution of 0.01 per cent. of cocain or morphin is required and in extremely rare cases as much as one hundred syringesful of this solution might be administered without evil effect. There is always a possibility that we may be able to reduce the dose to one-half or even one-fifth, long before this number is reached. The manner in which this is to be done will be detailed further on.

"The reasons why I combine morphin with cocain in my solutions and why I add a few drops of 5 per cent. carbolic solution to the 0.2 per cent. solution are these: I have found that infiltration of pure cocain solution in inflamed tissues in some cases causes pain before the occurrence of the anesthesia, especially in phlegmonous tissues where there is considerable hyperesthesia of the parts. This circumstance renders the method useless in the few cases in which it might be used if this drawback could be abolished. It must be remarked that this occurred in cases which owing to the size and extent of the operation lay well toward the limit of its availability. This trouble was, to our great surprise, almost entirely obviated by the addition of morphin to the cocain-salt solution.

"In the second place it could not be denied that occasionally the pain occurring after operation in inflamed tissues seemed to be stronger when pure cocain was used than after chloroform. Although a small dose of morphin removed the sequelæ of the operation very promptly, I was for a long time afraid that this circumstance would seriously interfere with the popularity of the method. To my great satisfaction I found that this combination thoroughly removed the objection. In many hundred cases I have found that the pain after operation with the use of the combined cocain-morphin-NaCl anesthesic is decidedly less than that after chloroform. On this account the solution I now use contains 0.025 per cent. morphin.

"The objection to the former methods of local anesthesia, the painfulness of the puncture, is obviated by the use of the ether spray upon the skin. (The ether spray need not be pushed to absolute freezing, as a moderate degree of chilling sufficiently diminishes the sensibility.—H. V. W.) or the application of a drop of carbolic acid or strong cocain solution upon the mucous membranes, and the use of a very fine needle. Then follows infiltration of the tissues; at first of the skin or mucous membrane by the formation of a line of adjoining wheals which

corresponds to the direction of the incision; deeper down everything is infiltrated that we wish to reach by operation. No part is to be operated upon until the artificial edema is complete.

"*Only the edematous region is anesthetic. The anesthesia is caused by the anemia, the compression, and the cooling. The pain of the infiltration of indifferent solutions is abolished by the minute doses of narcotic drugs (morphin, cocain and carbolic acid.) Anesthesia occurs at the moment of the completion of the artificial edema. The action need not be waited for. It occurs at once.*

"This method of combined infiltration-anesthesia has great advantages over the old methods of cocain anesthesia. I refer to this particularly, as it has been frequently stated that my method was nothing absolutely new. Even if this be so, it is a matter of indifference whether a method be old or new, so long as it be good, but there is certainly a difference between using a 2 to 5 per cent. solution of a drug or solutions containing from 1 to 5 parts per 1000 and the latter of which show vastly greater eligibility and usefulness. The injection methods in use up to this time were even theoretically dangerous and very limited in application; numerous cases of intoxication discredited them; deaths have been recorded, and on this account the old injection methods could not be substituted for general narcosis, as they share its gravest objection."

FORMULÆ, ETC.

The formulæ advocated by Dr. Schleich are as follows:

R.	Cocaine mur.	20	gr. iij.
	Morph. mur.	025	gr. ⅓.
	Natr. chlor	20	gr. iij.
	Aq. dest. ad. 100		℥ iij.
M.	Sterilisat. adde. sol. ac. carbol. 5 per cent., gtt. ij.		
S.	Solution No. 1, strong. For operation upon highly inflamed or hyperesthetic areas.		
R.	Cocain mur	10	gr. jss.
	Morph. mur	025	gr. ⅓.
	Natr. chlor.	20	gr. iij.
	Aq. dest. ad 100		℥ iij.
M.	Sterilisat. adde. sol. ac. carbol. 5 per cent., gtt. ij.		
S.	Solution No. 2, medium. For most operations.		
R.	Cocain mur	01	gr. 1-6
	Morph. mur.	005	gr. 1-12
	Natr. chlor.	20	gr. iij.
	Aq. dest. ad 100		℥ iij.
M.	Sterilisat. adde sol. ac. carbol. 5 per cent., gtt. ij.		
S.	Solution No. 3, weak. For superficial operations upon nearly normal tissues.		

All are to be kept strictly sterile; scorched cotton stoppers such as are used in bacteriologic experiments for the bottles; small quantities to be poured out in a smaller vessel for each operation. Just before operation the solution should be cooled by laying the bottle containing it on ice, and kept cold during the operation. The syringe should likewise be cooled. The common form of hypodermatic syringe with the finest of needles is all that is usually needed, although Schleich depicts in one place (see Fig. 8) a long curved needle. The former is kept in good order by being frequently soaked in a 5 per cent. carbolic solution, and the needles sterilized after each operation.

TECHNIQUE OF OPERATION UNDER INFILTRATION ANESTHESIA—INCISION OF THE SKIN.

"After thoroughly scrubbing, shaving and otherwise preparing the field of operation, we begin with the induction of anesthesia for the first puncture of the needle. (By use of the very fine needles of American make this preliminary procedure is practically uncalled for, as a fine sharp needle is scarcely felt when introduced even through the whole thickness of the skin of very hyperesthetic persons.—H. V. W.) Upon the skin this is done by means of a spray of ether, ethyl-chlorid (rhigolene, etc.) Upon mucous membranes we must apply a drop of 10 per cent. carbolic solution or cocain. The spray is directed to the point at which we desire to begin the anesthesia (it being, as a general rule, more convenient to proceed in a direction from the operator), until a slight discoloration of the skin appears. The needle is then inserted and pushed in parallel to the surface, until its beveled edge is covered. A slight pressure is then made upon the piston. A white wheal, the beginning cutaneous edema, appears at the puncture of the needle. (See Figs. 1 and 2.) This is increased to the size of a dime by continued pressure on the piston.

"The needle is moved and re-inserted at the periphery of the wheal, but still within it, and a new wheal raised. In this way the line of incision is marked out to any length desired. As soon as the line has reached the required length, we may use the knife, or we may prefer to infiltrate the deeper tissues through the skin. If the operation is to be a short one (not over twenty minutes) we may make the infiltration broad enough to include the line of sutures. In anesthetizing the subcutaneous tissue, I

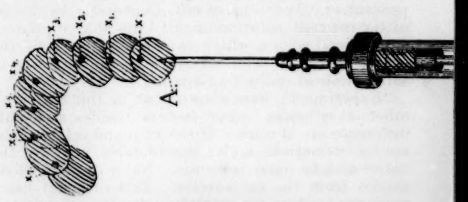


FIG. 2.—Formation of the cutaneous wheals. A. Spot made anesthetic by ether spray for the first injection.

allow a syringeful to three to four centimeters of length, so that the syringe may be at once emptied; even the fasciæ and muscles may be edematized through the skin. The entire field of operation appears as a high, tense, circumscript edema projecting beyond the level of the skin. Whenever we wish to operate with exact anesthesia, the field of operation must be tensely filled with the solutions, so that it exudes from the cut surface.

INFILTRATION OF THE DEEPER TISSUES.

"Wherever the subcutaneous tissue is loose and easily distensible, infiltration is easy and requires but little pressure; as over the malleoli and condyles, in the scrotum, labia, eyelids, on the backs of the hands; in short, in the regions where pathologic edema first shows itself. Stronger pressure is required where the parts are dense and hard, as in the sole and palm, in cicatricial tissue, the matrix of the nails, and in the hard palate. It is advisable not to anesthetize deeper than into the superficial muscles through the skin, except in cases where the deepest tissue sought for lies superficially, as over bony projections, in the scalp, over the clavicle and sternum. By slowly pushing in the needle until we feel the bone in these cases, we may even anesthetize the periosteum.

"*No tissue offers any deviation from the dictum:*

Every tissue is anesthetic that can be artificially edematized by our solutions. This holds good for skin and mucous membrane, periosteum, synovial membrane, fascia, muscle, lymph glands, nerves, viscera, and even bone. The latter becomes anesthetic as far as its periosteum is infiltrated because its nerve supply is derived from the periosteum, and because we can infiltrate the medulla by subperiosteal injection. Of this we have been able to convince ourselves many times. The bone whose periosteum has been infiltrated in its whole circumference may be divided by saw or forceps without causing any sensation. Within the area of the periosteal infiltration we may hammer, chisel, break or burn; the patient notices nothing but the noises caused thereby (except vibration? H. V. W.) and if we close his ears, he knows nothing of it. This will be better understood when we find, as we did in every case, that the marrow was infiltrated. As all the nervous elements are surrounded by the anesthetizing fluid, they must be anesthetic. In inflammatory bone diseases (osteomyelitis) it is often advisable to chisel a small hole into the compact layer and through this to infiltrate the marrow.

"If, during the operation, we reach larger nerve trunks, they may be anesthetized for a short time by touching them with 5 per cent. carbolic acid, or by injecting them with the same if we do not care to

FIG. 3.—Sutures.

infiltrate the surroundings. After incision, in all cases, the incision should be kept open by gentle and steady traction and the infiltration cautiously pushed into the depths of the wound. In amputations the nerve trunks must be anesthetized separately. Operation in non-anesthetic areas is due to personal want of skill or a lack of understanding of the principle of the method which, if properly used, in regions where it can be technically executed can not fail but must lead to an often astoundingly brilliant result. The operator must ever keep in mind that when pain occurs it is a sign of insufficient edematization. It is a personal error to cause a patient pain with this method, wherever infiltration is technically possible.

SUTURES.

"*It must be especially noted that the anesthetization of a given point lasts ten to twenty minutes.* If during an operation we come to a tissue which was anesthetized more than twenty minutes before, the infiltration must be repeated. In this way we can operate for hours. For instance, new wheals will have to be produced at the point of entrance and exit of the sutures if the operation has lasted more than twenty minutes. (See Fig. 3.)

"For short operations it is advantageous to anesthetize the skin so broadly that the suture line is included. In longer operations we may form wheals from below the cut edge of the skin, at the places in which we wish to insert the needle. (See Fig. 4b.) For deep sutures the same rule is applicable.

HEMOSTASIS.

"In general, it may be remarked that hemorrhage in fully infiltrated tissues is minimal; bleeding points are caught with forceps and tied as usual. It occasionally happens that nerve twigs accompanying arteries cause pain during the moment of compression. In such cases the spot should be touched with a 5 per cent. carbolic solution before cleansing the forceps. This will usually cause enough superficial anesthesia. If not we will have to produce a circumscribed infiltration in the neighborhood. In operations upon mucous membranes in which the technique is identical with that described, the primary anesthesia is produced by touching the selected

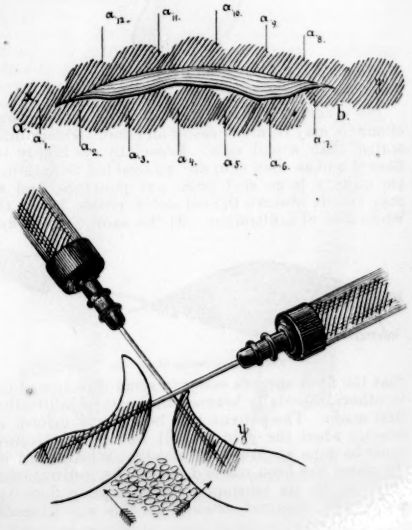


FIG. 4 A. FIG. 4 B. Secondary anesthetization of cut surfaces.

spot with a concentrated solution of carbolic acid or cocain. This is very readily done as it is much easier to insert a fine needle under the epithelium than into the skin. As soon as the first wheal is formed the rest is simple.

INFLAMED PARTS.

"There is, *a priori*, a very great difference between the anesthetization of a part with normal sensation and one with pathologically increased sensibility. In the latter case, the inflammatory hyperesthesia requires some deviation from the general rules of technique given. It is, however, indubitable that even the extreme hyperesthesia of inflammation is abolished by the artificial edema in our methods. As soon as infiltration is complete, pain during operation is excluded. But it is indispensable for the attainment of this object that the infiltration *be begun in sound tissues* at a distance from the inflamed

focus. (See Fig. 5.) We begin as far from it as practicable (several centimeters) with the ordinary cutaneous anesthesia (ether spray and skin puncture) and then push the needle obliquely through the skin, into the subcutaneous tissue, toward the inflamed focus, injecting slowly a syringeful of solution, being careful to keep the fluid outside of the inflamed area. In this manner, four or more depots of infiltration are placed about the inflamed part and then the cutis may be infiltrated completely around it. (See Fig. 6.)

FIG. 5.—Infiltration for ingrowing toe-nail.

The inflamed skin with its dilated blood and lymph channels may be much easier and more widely infiltrated than sound skin. Especially in highly inflamed and swollen skin are we enabled to anesthetize quite a large spot from one puncture, and we may clearly observe the red color recede before the white zone of infiltration. At the same time we find

FIG. 6.—Infiltration of abscess.

that the fluid spreads easier in some directions than in others, especially between the spots of infiltration first made. The patient will be able to inform us exactly when the pain is still felt. The injection must be done at first very slowly. When, however, the point has been reached where the infiltration is only felt by its tension, we may rapidly flood the part to the required extent. In this way I usually

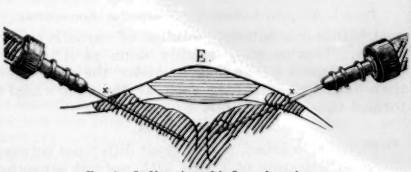


FIG. 7.—Infiltration of inflamed surfaces.

treat furuncles and carbuncles. If incision only is required, matters are much simpler. A straight or crucial line of infiltration is made and the knife used. If desired, the deeper parts can then be anesthetized.

"Under no circumstances must fluid ever be primarily injected into an abscess, an exudation or a pathologic focus. The only result is increased tension, which may be quite painful. Where an abscess (deep?) exists or is suspected, it is better to first anesthetize the skin, incise it, to infiltrate further and make a minute incision to evacuate the pus and after this to complete the infiltration and operation. The most important rule in inflammatory cases is: Never begin the infiltration in an inflamed area or abscess, but surround it and advance upon it from all sides *via* the sound skin. (See Fig. 7.) In these cases we first use Solution 1, and when the infiltration causes no more pain, Solutions 2 and 3.

"In chronically inflamed tissues, especially when sclerosed or cicatrized, Solution 1 is needed, if the formation of neuromata renders the tissues more sensitive. In such tissues considerable pressure is necessary; in one case of mammary scirrhus, I was unable to inject a single drop into the tissue. Here the usefulness of the method reaches its limits, as in all cases where infiltration can not be done anesthesia does not result. These cases are extremely rare, even, compared to the cases in which narcosis is contra-indicated or in which it fails."

In looking up the literature[5] of the subject, by reference to the Index Medicus, I can find but the one article by Cholewa before mentioned. It is safe to surmise that this method has not yet been taken

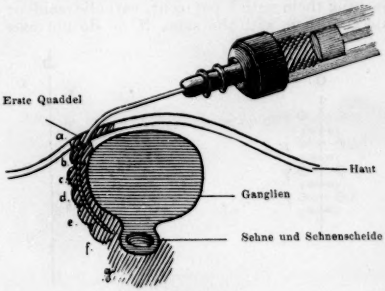


FIG. 8.—Tumors.

up in this country and that we are first in the field of American surgery to present our views in corroboration of his statements.

I began following out Schleich's line of experiments; at first trying his stronger solution (No. 1) and following directions carefully, was surprised to find that the second prick of the needle was not felt, and after building the line of wheals along my forearm, I pricked and cut the skin afterward, weaving a suture needle in and out without the slightest sensation. I injected the various fluids into my own flesh many times before trying them on others. The thanks of the author are due to Drs. Barnes, Hitz, Hosmer and others together with some of my patients, for the use of their bodies in proving the anesthetic nature of these fluids.

My first operation was done upon my children's governess who had a deep felon on the index finger of the right hand, in which I made a free incision down to the bone without the slightest pain from the knife, after the injection of the solution of medium strength (No. 2). After the anesthetic effect had passed away, the after-pain was less than would be expected and healing was perfect. I next evacuated an

[5] In the Med. Record, Nov. 24, 1884, there is a brief note, the author of which is apparently not conversant with the subject.

abscess of the lid without pain, removed a papilloma from the inner canthus, opened another abscess of the upper eyelid which was extremely sensitive to palpation, without the patient perceiving the cut of the knife, and feeling the curettement as but a sensation of scratching; opened a painful stye and a number of other minor operations of like nature.

On detailing my experience to Dr. A. J. Burgess he was much interested in the method and desired to have a small growth removed from his own axilla, which Dr. F. E. Walbridge and I did, putting in four stitches without causing our patient a twinge. He then went about his usual work, using the arm freely. This was a sebaceous cyst, about the size of the first joint of a man's thumb. A circumstance which may militate against the method, should it happen in any proportion of cases was that, when the stitches were removed one week afterward, it was found that the wound had not yet healed, although there was no sign of infection. If I remember rightly, healing in the neighborhood of the armpit sometimes goes on very slowly. The demonstration to these surgeons was sufficient to warrant them in trying the procedure in their own practice and, accordingly, the next day Dr. Burgess called me in consultation at the Presbyterian Hospital, over a circumcision in an old man (with cardiac lesion) a former patient of mine. After I made the injections Dr. Burgess proceeded

FIG. 9.—Infiltration of foreskin.

with the operation, Dr. Stanton Allen being present. The patient being talkative, was conversing about another subject while Dr. Burgess cut off his foreskin and sewed up the divided edges of mucous membrane and skin. Not the least twinge of pain occurred during the whole operation, which lasted fully twenty minutes. The effect on us was certainly conclusive, and we thought that we should not hesitate to try the method on an amputation or other major operation.

Later, Dr. Burgess excised an epithelioma with local anesthesia by this method from the face of an old lady who had been once before operated upon under cocain-anesthesia and who had refused further operation if it was to be used, as she had suffered from pain during the previous operation. The effect was here favorable and I understood that she remarked, when told that if it recurred, the growth should be removed: "If you don't hurt me any more than you did this time, Doctor, you may come up every day and operate if necessary."

Dr. Burgess did a clamp and Paquelin cautery operation on a patient of mine, after I had infiltrated the parts with the solution of medium strength. The patient felt the heat on the surrounding parts and only once during the operation when the third pile was seared away did he complain of any amount of pain. What did occur, I think could have been avoided by first cutting off the piles and then searing the stumps with the cautery instead of burning it all away.

Dr. Thos. Hay removed an epithelioma of the nose of the size of a quarter of a dollar, and put in three stitches after I had injected the No. 2 fluid, in an old man in whom general anesthesia would have been contra-indicated. Dr. K. Morris was present at the operation. When the man was asked in regard to his sensations he remarked during the curetting of the base, "that it felt as if one were scratching on the outside of his old leather boot." Only recently I took a patient ot Dr. Thos. Hay, with a crushed toe, the result of a football injury. After injection with Solution No. 2, a knife was passed under the nail to the root and pus evacuated without sensation. I understand that Dr. Shimonek has done a couple of operations by this or a similar method.

I have done other cutting operations that would have caused pain which was entirely prevented and healing has properly progressed in all. Schleich claims that he and his colleagues have made 3,000 operations by this method, and it seems to me that it will certainly not only drive the hypodermatic injection of cocain and the freezing methods of anesthe-

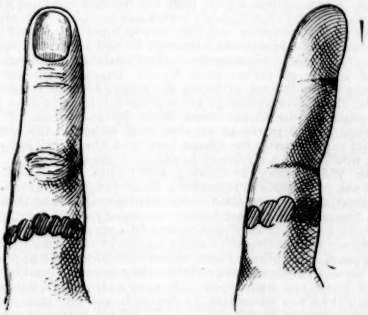


FIG. 10.—Infiltration for amputation of the finger.

sia from the field, but replace general narcosis for at least 75 per cent. of the operations for which it is now given.

There are, certainly, cases in which edematization of the tissues is impossible as heretofore noted, as in some cases where much handling or tension of the parts is necessary, as in most abdominal or pelvic operations, and in others it may not be advisable to have the patient consulting with the surgeon during the operation. Likewise when edematization would interfere with the nicety of the surgeon's work, as in some plastic operations, in ophthalmic surgery as relates to the eyeball, nasal surgery, etc., it is not to be recommended.

But the vast majority of cutting operations for which the surgeon is consulted, some gynecologic and rectal work, the greater number of plastic operations, abscesses, tumors and minor amputations, may be done by the method. According to Schleich, all operations should be done in this manner and he has given up general anesthesia entirely.

If by further trial, his statements be fully verified and the method becomes generally known, the fear of

the knife will go and the deaths from anesthesia will be fewer, as general narcosis will be employed for only the most formidable operations.

805 Grand Avenue.

DISCUSSION.

DR. WÜRDEMANN then demonstrated the technique of the method and the existence of absolute anesthesia therefrom, by injecting the skin of the fore-arm with the weaker solutions (Nos. 2 and 3), on several of the members of the society. A line of wheals was first made in the skin and then a large spear-pointed needle woven in and out of the whole thickness. This demonstration satisfactorily proved the painlessness of the procedure.

DR. BURGESS opened the discussion by saying that he had felt absolutely no pain during the operation on himself and that he could not account for the slow healing in his own case, except that the solution might not have been sterile although he said that now the stitches had been removed the wound was entirely healed. He described the operation for piles and attributed the pain that was felt to the heat on the surrounding parts. In the case of epithelioma and the circumcision, the operation and healing had been in every way satisfactory.

DR. SHIMONEK spoke of reading the article by Cholewa, in the JOURNAL, and of trying the method afterward. As the directions in the article were not explicit, he had mixed up a solution containing a fraction of a grain of cocain to the ounce and had operated upon an epithelioma of the face and upon a case of external piles (cutting operation) without causing pain, and healing had gone on normally. He asked Dr. Würdemann why it was that the skin just outside of the areas injected was in these cases apparently anesthetic.

DR. NOLTE desired to know if the solutions could be sterilized after being made up.

DR. KAUMHEIMER stated that on reading Schleich's brochure he found that Merck's cocain and morphin were stated to be perfectly sterile, and that he was much impressed with this method of anesthesia, although he had not yet an opportunity to try it in his practice. He stated that the pile clamp used in the operation done by Dr. Burgess reduced the edema of the tissues, allowing the return of some sensation.

DR. MERENESS wished to know if the application of a rubber ligature in amputations done by anesthesia of this method, would prove of service, as if ischemic, the tissues would more readily be edematized and the resultant enemia would have a tendency to diminish sensation.

DR. WÜRDEMANN, in closing, said: That our experience was not yet sufficient to make a final judgment as to the application of the method or its disadvantages, and that he had brought the subject before the society on account of its novelty and promise of usefulness, in order to interest the many surgeons present to make a trial of the same in their own practice, beginning with minor operations and applying the same to more serious cases as they acquired confidence.

DR. SHIMONEK had apparently used a stronger solution of cocain than any advocated by Schleich, and had thus established narcotic depots in the site of his injections from which the surrounding tissues had been rendered anesthetic. Dr. Kaumheimer's reasons for the pain in the operation done by Dr. Burgess were substantial, as the clamp certainly squeezed the solution out of the tissues. Dr. Burgess had used a metal clamp from which for some reason the non-conducting plate had been removed and which had become quite hot, necessitating its cooling during the operation. He had also burnt away the whole substance of the piles without cutting. A change in the technique of the operation by which the instruments and surrounding tissues would not become heated would obviate this disadvantage. As much care should be taken of the solutions as is used in bacteriologic work and they should be sterilized by heat each time the bottles are opened. The slight amount of extra care involved would save many septic operations. The liability of sepsis would be the principal objection to the method by unskilful hands, as it was evident that this condition would be more likely to result if an impure fluid was infiltrated into the tissues than if only brought in contact with their cut surface by unclean hands, etc. He had brought the subject up as a statement of fact and had left it in the hands of the society with the recommendation for trial of the same in their own practice.

DR. FRIEND then moved that a vote of thanks be tendered the author and assistant for the preparation of the paper, which was carried.

ADDENDA.

Since writing the foregoing, our experience of infiltration anesthesia has been widened by a number of operations. While in Chicago December 2, through the kindness of Dr. J. B. Hamilton I was enabled to demonstrate this method upon several trying cases at the U. S. Marine Hospital. These were three cases of phimosis, the results of chancre and chancroid in which the foreskins could not be retracted sufficiently to expose the glans and permit of proper injection of the mucous membrane. After infiltration of the skin the dorsum was slit by scissors and the foreskin held by forceps and then cut off by the scissors, a number of stitches being afterwards taken. In the first case, the slitting of the foreskin was painful, as the mucous membrane had not been anesthetized and as I had unwittingly made several subcutaneous injections there was too much edema of the tissues which interfered with proper placing of the stitches. In the second case the surgeon endeavored to make the injections himself, but owing to inexperience with the technique of endermatic injection did not succeed in properly infiltrating the parts. He then determined to complete the operation without anesthesia "for contrast" and to get rid of the element of suggestion. This operation was done amid the yells of our patient. On the third case we were enable to properly inject the structures; the only time that the patient showed that he experienced pain was when the dorsum was cut and at the first prick of the injection needle. In this case, the resultant edema did not interfere with the proper placing of the stitches. On the whole, the superior efficacy of this form of anesthesia over that given by general narcosis, was satisfactorily demonstrated. Since, I have used the method in one operation for ectropion and in several minor procedures. December 20, I assisted Dr. John McDill in excising a chancre of dorsum of the penis, using infiltration anesthesia. The patient watched the operation and said that he had absolutely no sensation of pain. December 10, I received a letter from Dr. Hosmer, of Ashland, in which he mentioned that he had operated upon a tumor, an abscess and a case of hemorrhoids with satisfaction to both the patient and himself. Drs. Wm. and P. H. Jobse removed necrosed bone from the leg by this form of anesthesia and a number of our colleagues have had experience with the method since my exposition before the Milwaukee Medical Society Nov. 20, 1894. Dr. Casey A. Wood, of Chicago, recently demonstrated the method at the Cook County Hospital. Dr. Rumpel and others in that city have since operated by this manner.

Too great stress can not be laid upon perfection of technique, as any spots which have not been infiltrated retain their sensibility. Although I have acquired a certain degree of skill in making these injections, my own experience is not sufficient to make me perfect in this procedure. Endermatic injection is somewhat difficult and until its technique is acquired the surgeon will not have satisfaction. Even those of wide experience, like the eminent surgeon before mentioned, will have to master the details by careful application. This may be raised as an objection by some. Again, the surgeon must become accustomed to working in edematized tissues and in certain localities the resultant swelling of the parts may decidedly interfere with the delicacy of the operation. When working on mucous membranes as in circumcision it would be better to combine the infiltration of the tissues with brushing over the mucous membrane by a solution of cocain of the

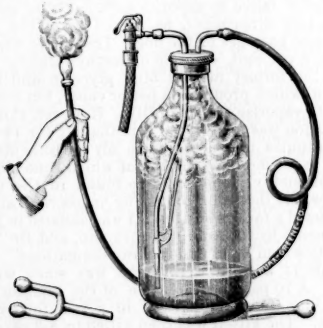
ordinary strength. I trust that the profession generally will test the method upon a wider range of operations than here described and that some will soon report their experience.

TOPICAL TREATMENT OF THE AIR PASSAGES, WITH EXHIBITION OF A NEW ATOMIZING VAPORIZER.

BY HOMER M. THOMAS, A.M., M.D.
CHICAGO.

The topical treatment of diseases of the air passages is a subject of much interest to the medical profession. It is fortunate that such is the case when we consider that in the disease of pulmonary consumption alone, the death rate is one in six or seven of all deaths in the United States, not even counting those which result from other diseases of the respiratory organs. This statement is not true of any other disease or diseases. Probably the mortality is due to two facts: 1, that this class of diseases is very difficult to prevent or cure; and 2, that medical research has given less attention to these specific diseases.

In presenting the subject of topical treatment of the air passages, there is no intention of claiming



that a new method or remedy has been discovered, but rather a wish to emphasize the importance of thorough local application of drugs to the affected passages. For some ten years it has seemed to me that the most rational treatment consisted in the local application of drugs to the affected part as one media of cure, not neglecting, and recognizing the importance as well, of the great value of general constitutional treatment. One difficulty which has appeared to lie in the way of the thorough application of drugs to the affected air passages has been in the unsatisfactory action and hence imperfect construction of the various atomizing inhalers furnished the profession. These instruments have either been too delicate in construction to permit the use of sufficient pressure to make a possible deep penetration of the vaporized medicament into the air passages, or become so easily clogged up with the medicament used as to create great annoyance in their use.

The instrument which I am now able to present (made for me by Truax, Greene & Company) is the result of some little time and effort spent in striving to secure an atomizing vaporizer which would overcome the objections mentioned, and make it useful for the purpose desired. It consists of a heavy glass bottle, ten inches in length and twelve in circumference at its widest portion, narrowing at the top to a circumference of three and one-half inches. The bottle part is of very heavy glass and is tested to withstand a pressure of one hundred and twenty pounds to the square inch. The atomized vapor is produced through a tube made of German silver and heavily nickel-plated, which is nine inches in length. Three inches from the lower end are two tubes, the ends of which approximate to within one-eighth of an inch of each other. The opening of the inner tube is one-third that of the outer tube, which is one-half inch in circumference. When in use, the motive power being compressed air, varying in pressure from five to fifteen pounds to the square inch, enters the main tube, and two-thirds of it is ejected at the mouth of the inner tube, the remaining one-third passing down into the medicinal menstruum, from which it assists in forcing a solid column of the medicament to the mouth of the outer tube. The whole mass is then projected in an atomized form against the inner side of the bottle near the top, from whence it falls in rivulets to the bottom of the bottle, the residue escaping from the top through an outlet opening in the form of a very fine smoke-like vapor. A screw cap, within which is a screw thread three-quarters of an inch in length, securely anchors the top to the bottle. I have found this instrument to be strong, durable, easily cleaned, perfectly antiseptic, and to meet the requirements of this special form of medication.

The uses to which this atomizing vaporizer can be put in the topical treatment of the air passages are many. I have found it of value in the treatment of acute Schneiderianitis where there is a marked swelling of the turbinated bodies, that is, in the intumescent states without true hypertrophy. It is also valuable as a protective to the inflamed nasal surfaces after the use of strong astringent applications. As a palliative to be used after deep linear galvanocauterizations it affords marked relief. The periodical attacks of acute influenza from which so many suffer in this climate are to quite a degree alleviated by the use of topical treatment with the atomizing vaporizer. It is of slight value in the treatment of hay fever, but its use in this affection is very limited.

In follicular pharyngitis, after the diseased follicles have been punctured or removed, the covering of the inflamed surface with an oily menstruum through the media of the vaporizer affords much comfort and relief.

In acute and subacute laryngitis, where you wish to secure an alterative, astringent, or soothing application over the entire inner surface of the larynx, it will be found useful for this purpose. The most striking benefits in the use of the atomizing vaporizer are to be found in the severest cases of acute, subacute, capillary and chronic bronchitis. In those cases, where there is a tenacious, thick, yellowish, and often greenish bronchial discharge accompanied with or without dyspnea, it is quite astonishing with what success old cases of bronchitis, even complicated with emphysema, will be benefited. Beginning the inhalation in these cases, you usually have explosive coughs accompanied by the expectoration of a large amount of phlegm, the vaporized medicament appearing to loosen the secretion from its membran-

ous attachment. The phlegm, as treatment progresses, usually loses its muco-purulent character and is decreased in quantity. As a general rule you will get the most marked benefits within the first ten days or two weeks of treatment. After that the improvement is slower and finally reaches its maximum effect. This treatment will not cure completely a large proportion of cases of chronic bronchitis, but affords very marked relief, and the incurable cases appear to me to be due to the reaction following the severe and sudden changes in temperature which we so frequently have.

I see no reason why, in cases of pertussis this form of medication should not be valuable, but my experience is limited in these cases. I have found in cases of fibroid phthisis, where no bacilli could be detected in the sputa, that the deep and prolonged efforts at inspiration assist greatly in enlarging the respiratory area; that is, a vaporized medicament carried into the lungs, under a pressure of some fifteen pounds to the square inch and assisted in its ingress by the voluntary deep inspirations of the patient, assists in opening many of the closed air vesicles. The greatest success in this method of treatment will depend upon the ability of patients to inhale the medicaments deeply. It is astonishing how few patients really know how to take a deep inspiration. As a rule the inspiratory effort is limited to the supra-clavicular and infra-clavicular regions, hence the necessity of the intelligent coöperation of the patients in inspiring the inhalants. Necessarily a vapor which is principally suspended in the mouth and throat is imperfect because of the lack of inhalation. Patients describe the sensation of the vapors as extending down into the lower and deeper portions of the lungs. Occasionally, there will be experienced a sensation as of the presence of the vapors as low as the diaphragmatic line. In my experience there can be no possible danger to the patient from the persistent, prolonged and deep inspiration of the vaporized medicaments, the manner in which I use the apparatus making it entirely voluntary, and optional with the patient how deep and prolonged the inspiratory effort is. This I consider of marked advantage, as the sensations experienced can, as a rule, be relied upon as to the desirability of prolonging or discontinuing the treatment. Laying aside for the present any considerations of the therapeutic action of the medicaments inhaled upon the air passages, I believe the chest expansion of a patient can be increased from one-half to two and one-half inches by the daily use of the inhaler. My method of using the inhaler is to take for the nasal passage a tube like this (here the speaker exhibited a tube) if it is desired to treat only one nasal passage at a time. Where you wish to treat two at the same time I make use of the double bulb, and in giving the inhalations directly through the mouth, use is made of this tube. I now desire to present for your consideration a series of experiments with the atomizing vaporizer, which were undertaken to determine how deep the vapors penetrate into the air passages.

August 12, a kitten was placed in a pine box, twenty-one inches in length, eleven inches in width, twelve inches in height, with dove-tailed seams. A half inch hole, two inches from the bottom in the lower end was made for the entrance of vapor. A half inch hole at the top of the further end of the box, two inches from the top end was allowed for the exit of vapors. A vapor consisting of 5 per cents pure iodin in a 2 ounce solution of blandin which I believe to be simply a neutral oil, was used for the experiment. A pressure of compressed air, about nine pounds to the square inch, was used to pas. through the inhaler to generate the vapor. The vapor was introduced continuously for twenty minutes; at the end of this time the kitten was removed from the box and immediately killed by an injection of 60 minims of a 3 per cent. solution of prussic acid per rectum. The respiratory tract was then removed. The starch test for the presence of iodin was then applied to the air passages with the following result: Iodin was found to be present in the mucus from the mouth, on the tongue, in the pharynx and larynx. A typical reaction was obtained of the iodin the entire length of the trachea to just below the bifurcation into the bronchial tubes. A slight iodin reaction was also found in the upper part of the larger bronchi. No presence of iodin could be found in the smaller bronchial tubes or in the air cells.

A second experiment conducted on the same day consisted of placing a dog, weight ten pounds, in the same box. A solution of 5 per cent. methyl blue in glycerin and water, equal parts, in a 2 ounce mixture of blandin failed to vaporize sufficiently to make a satisfactory experiment, as viewed upon the nasal and throat passages of the dog. Then there was substituted 5 per cent. solution of methyl blue in blandin to the former methyl blue, glycerin and water solution, which produced a better vapor, but was too liquid to vaporize satisfactorily. However, this latter solution was introduced into the box for twenty-three minutes under the same air pressure as the former experiment, at the end of which time no evidence of methyl blue could be found in the nasal passages, the throat or tongue by inspection, and it was deemed a failure as a test. I was assisted in these experiments by Dr. Adolph Gehrmann, and Dr. E. F. Wells, to whom I am under many obligations.

August 14, a third experiment was made with a kitten. A 10 per cent. solution of the trichlorid of iron in blandin was vaporized in a box for twenty minutes. The kitten was then killed by a 3 per cent. prussic acid solution introduced per rectum. A solution of ammonium sulphocyanide was then used, to determine the presence of iron salts. The result showed a marked reaction in the mouth, tongue, pharynx and larynx. No test visible on the epiglottis, trachea, bronchi or air cells. Dr. Adolph Gehrmann assisted me with this experiment.

August 14 a fourth experiment was made under the same conditions as the former ones and a ten pound dog was used. A 7½ per cent. solution of pure iodin used with blandin as a base was introduced into the box for twenty minutes. During the course of the experiment this dog was very much excited and made strenuous efforts to escape from the box, and as a consequence his respiratory efforts were greatly accelerated. At the end of twenty minutes the dog was killed with a 3 per cent. solution of prussic acid injected per rectum, and the starch solution used upon the air passages to determine the existence of iodin. This test was a very satisfactory one. There was a hypersecretion of mucus which upon test with starch showed the existence of iodin on the tongue, pharynx, larynx, trachea and larger bronchial tubes down to the medium sized bronchial tubes.

Dr. Adolph Gehrmann made a microscopic exami-

nation of the mucus which was found to contain iodin, and demonstrated its existence down to the openings of the smaller bronchial tubes.

This experiment positively demonstrated that the starch test solution was colored by iodin to the mouths of the smaller bronchial tubes. There was no evidence of iodin to be found in the pulmonary alveoli.

On August 16, I secured a dog, weighing some twelve pounds, and placed him in a box of the following dimensions: Twenty-seven and three-quarter inches long, eighteen and three-quarter inches high and twelve inches wide, inside measurement. This would make the capacity of the box equal to 6,243¾ cubic inches. A one-quarter inch opening was made in the middle of the top of the box for the entrance of vapor, and a one-half inch opening two inches from the bottom of each end of the box for the exit of vapors. For fifteen minutes a vapor consisting of a solution of equal parts of blandin and a saturated solution of starch was vaporized continuously in the box. During the whole progress of this experiment the dog remained very passive and quiet in the box without the slightest resistance, and in fact appeared to rather enjoy what must have been to him a novel proceeding. At the end of fifteen minutes the dog was removed, and as there was found no evidences of starch upon the air passages easy of inspection without killing the dog, it was concluded that the starch had not penetrated any considerable distance, and hence a new vaporized solution consisting of 20 per cent. solution of iodin in blandin was substituted in the vaporizer. This same dog was allowed to remain in the box twenty-three minutes, at the end of which time he was killed with a 20 per cent. solution of the cyanide of potassium introduced per rectum, 6 drachms of the solution being required to produce death, which occurred in three minutes. Upon removing the air passages, the starch test failed to show the presence of iodin anywhere except in the mouth. Also a microscopic examination of the air passages failed in showing the evidences of any penetration of the iodin. I was assisted in this experiment by Dr. C. D. Wescott and Dr. Adolph Gehrmann.

I am unable to explain the failure of this test to demonstrate the existence of the vaporized inhalant in the air passages, and I believe both Dr. Wescott and Dr. Gehrmann were equally at a loss to understand its failure, as the conditions under which the test was made appeared to be favorable for a successful demonstration. Possibly the inertness of the animal used had something to do with it, as he appeared to make no effort at deep breathing whatever.

In conclusion, it seems to me as a result of quite an extensive experience in the use of vaporized inhalants among patients, as well as in the light of the experiments upon animals quoted, that we are justified in claiming that it is possible for vaporized medicaments to penetrate the air passages as far down as the openings of the mouths of the minute bronchial tubes, and that we may reasonably expect in cases where the inhalants are used that the benefit to be derived is in proportion to the therapeutic relation that the vaporized medicaments bear to the diseased condition. I have purposely avoided any suggestions as to the use of any particular combination of drugs to be used for any given condition in the inhaler. In a general way, I would advise the selection of such combinations as are but slightly irritating to the air passages to begin with, and then as the patients become more tolerant to the action of the medicaments their strength can be increased as necessary. I have thought that in cases of pulmonary tuberculosis considerable benefit was derived by the inhalation of a 1 to 3 per cent. solution of beechwood creasote, used in solution with some neutral oil, as blandin or albolene.

The paper, as presented, I hope to be but a preliminary one to a series of more extended and extensive experiments, which will have for their purpose the demonstration of the extent and permanency to which vaporized inhalants may penetrate the air passages.

DISCUSSION.

DR. E. FLETCHER INGALS said that experiments showed that the vapor occasionally penetrates to the larger bronchial tubes, in rare instances to the finer tubes, and in the rarest instances to the smallest tubes. The topical treatment in diseases of the air passages must be confined largely to the larynx and trachea, and perhaps to some extent to the bronchial tubes. The suggestion that the remedy should be non-irritating is very important for physicians who desired to medicate patients in this way. Some benefit might be derived from the inhalation of the vapor in tuberculosis. The instrument exhibited was an excellent one, but there was a possibility of the tubes becoming clogged. This was largely true of all other instruments that had been invented.

DR. MOREAU R. BROWN had the pleasure of seeing some experiments made on dogs and other animals similar to those reported by the essayist, and the results were that the vapor did not penetrate very deeply into the bronchi. He was inclined to believe that in the human subject we can get a solution deeper into the air passages than in animals, because in man there was the power of deep inhalation and the attempt to draw the solution deep into the air passages. The ipecac treatment penetrated well into the tubes. He thought iodoform dissolved in either, deeply inhaled, would penetrate further than an iodin solution, if carried in by the globe inhaler. The only objection to the instrument exhibited was that it does not properly vaporize watery or oily solutions. This could be accomplished by the globe nebulizer.

DR. WILLIAM E. CASSELBERRY directed attention to the proper position of the head and tongue when an attempt is made to give a spray for inhalation into the air passages. This might explain the diversity in the results obtained from the numerous remedies used. Some penetrate deeply, while others did not. He was satisfied that the spray could be made to penetrate a considerable distance into the bronchial tract.

DR. NORVAL H. PIERCE directed attention to the closure of the nose. If a tube is inserted in the mouth and the patient told to breathe through it, he used the nose instead; therefore in the use of any inhaler the nose should be closed and respiration carried on through the tube. He had used the globe atomizer in forcing vapor into the middle ear in a case of otitis media, after having performed paracentesis, and there was no doubt but that the vapor had penetrated the middle ear.

THE TEETH OF OUR SCHOOL CHILDREN; WHAT CAN BE DONE TO SAVE THEM?

Read in the Section on Dental and Oral Surgery, at the Forty-fifth Annual Meeting of the American Medical Association held at San Francisco, June 5–8, 1894.

BY J. C. McCOY, M.D.

SANTA ANA, CAL.

No doubt this question has been asked by every intelligent practitioner, as day by day he looks into the oral cavities of Young America, seeing there the almost universal dissolution of the masticatory organs. Those who live in small cities or towns and practice for all classes of society, have a better opportunity to know the condition of the teeth of the masses than does our city brother with his aristocratic patients.

A large majority of the people can not pay for

skilful operations, and their teeth must be saved in an inexpensive manner or be gradually lost before middle age, to be replaced by miserably fitting rubber dentures, with the accompanying shrunken alveola and uvula-like appendages called gums, condemned to worry through the remainder of their earthly existence feeling that nature did a poor job on their masticatory organs, or they would have lasted till old age, irrespective of ignorance and neglect from their earliest childhood. Ignorance and neglect go hand in hand, and are the cause of more diseases and of the loss of more teeth than all other causes combined.

For the past ten years my practice has been in a community that numbers among its citizens many persons of culture and refinement. Others whose exterior apportionments of life are all that could be desired, and whose children are being trained in all the arts and sciences of the day except that of cleanliness of the mouth. We have thousands of this class. I have examined and worked for hundreds of them in the past ten years. The ignorance on the part of the parents, and neglect on the part of the children who know better, is one of the wonders of the nineteenth century.

In one school of 700 pupils, 500 from 10 to 18 years of age, I distributed printed slips with the following questions: Do you cleanse your teeth with a brush every day? Do you cleanse your teeth with a brush twice a day? The teachers requested the pupils to answer the questions by writing the word yes, or no, to each question. The slips were immediately gathered up. On summing up it was ascertained that out of 500 pupils, 50 cleaned their teeth twice a day; 275 used a brush sometimes; while 175 did not own a brush. Notice, the ages were from 10 to 18. In the primary department of 200 pupils, from 6 to 10 years of age, the teachers said they did not think there were 10 children in the department who used a toothbrush.

This school is not an exceptional one in this matter, as further inquiry and investigation demonstrated. In fact its graduates take high rank at our universities, and if there is any difference, it is in advance of most schools in percentage of those who have clean mouths, as well as neat clothes and bright faces.

When there is so much neglect, and so little real care of the mouth, it is not at all strange that the sixth year molars have to be sacrificed daily, because the parents can not go to the expense of treatment to have them preserved, thinking all the time that this most valuable tooth is deciduous, and soon to be replaced by one that is bacteria proof and will last forever, in a mouth that has never been properly cleaned.

The school of 700 pupils mentioned, where only 50 made any pretense to regularly care for the teeth, shows what a field for instruction and training every teacher has. What an opportunity for philanthropy and missionary work!

Our children's teeth must be saved. Experience has taught us that it is impossible to repair the ravages of decay, except in a limited degree. Prevention through cleanliness and proper care of the teeth is the only way possible and practicable, to limit the wholesale destruction. Yes, I say limit, for even when ordinary care is used there is still room for the work of the skilful dentist.

The question before us is, What can we do to save the teeth of our school children?

American dentistry leads the world to-day, and the world justly honors us for the great advances we have made in the preservation of teeth; but the fact still confronts us that millions of teeth are annually lost in America, that need not have been sacrificed if proper care and cleanliness of the mouth had been begun in childhood and continued to manhood and womanhood.

The dentists of America, a noble and philanthropic band of 20,000, have done much to educate and train our citizens in the care of their teeth. We must do more. And at the same time in order to multiply our usefulness, we must solicit the aid of our public school teachers. With their coöperation we can reach and train millions of children.

A majority of the children of our land are in our public schools. They are under the teacher's instructions from 5 to 17 years of age. If the teachers were required to instruct and train the children in the proper care of their teeth, and to insist upon their carrying out such instructions practically at home, we would have accomplished—or at least begun—a great work. If such pupils could be trained from infancy up through all the grades to the high school, I am very sure we would see men and women with better teeth than the average American of to-day. The teachers are the only ones who can do this work. The parents of a large per cent. of the pupils are ignorant and careless almost beyond belief, and their children will follow in their footsteps, unless we dentists of America come to the rescue.

How can we bring this matter prominently before the educators of our land and secure their hearty cooperation?

I hope this ASSOCIATION will pass resolutions on the subject, indorsing the plan, and by its sanction give prominence to its importance.

Let the dental and medical press advocate it. Let each State dental association not only pass resolutions on the subject, but appoint a competent committee to arrange a manual on the subject of the care of the teeth. Let the same committee induce the State board of education to adopt such manual as a text-book to be used by teachers, and taught in our normal schools, requiring teachers to be able to pass an examination upon the contents of such manual, and then require them to carry out such instructions in their respective schools. May each one of us constitute ourselves into a special committee, to see that the spirit of this paper is carried out practically in the schools of our neighborhood.

It is not necessary for me to give more than a few hints on the subject to this body of intelligent dentists before whom I have the honor to speak. I hope to gain not only your hearty approval to this plan, but your enthusiastic coöperation, so that inside of twelve months every public school in our broad land will have begun the much needed reform of cleanliness of the teeth and mouth. So that in the future examinations of schools on the subject of oral hygiene, instead of there being only 50 out of 700 who clean their teeth regularly, we will not find 50 careless ones in 1,000.

This is a great work. We alone can do it. Let each one of us resolve to do our full share and prove ourselves philanthropists to the rising generation.

ORIGINAL INVESTIGATIONS ON THE NATURAL HISTORY, (SYMPTOMS AND PATHOLOGY) OF YELLOW FEVER. 1854–1894.

BY JOSEPH JONES, M.D., LL.D.
NEW ORLEANS, LA.

(*Continued from page 948.*)

CHAPTER II.

The following cases will serve to illustrate the effects of a preceding attack of malarial paroxysmal fever, upon the progress of the symptoms and pathology of yellow fever:

PATHOLOGY OF YELLOW FEVER RELATIONS TO MALARIAL FEVER.

Case 17.—Remittent fever followed by yellow fever; patient reduced in strength and anemic before the attack of yellow fever; fatal issue; liver presented the marks of both yellow fever and malarial fever. Mark Curtis; age 22; native of Germany. Entered Charity Hospital, Oct. 18, 1873. Patient states that on October 3 he was seized with vomiting followed by high fever; the vomiting and fever returned every alternate day, until his entrance into the hospital. Previous to this time had been exposed to the malaria of the swamps; came to New Orleans on October 3, 1873. Has resided in America five years, and in Louisiana since October 1 of the present year.

October 18. Patient very anemic and sallow; lips bloodless; gums pale; tongue very pale and flabby, with edges indented by the teeth; pulse 92; respiration 26; temperature of axilla 101.5 degrees.

October 19, 8 A.M. Patient complains of pain in upper and lower extremities. Tongue pale, flabby and furred at the center. Patient anemic, feeble, lethargic and without appetite. Urine abundant and without albumen. Bowels not constipated. Pulse 66; respiration 22; temperature 99.5 degrees. 7 P.M., pulse 72; respiration 20; temperature 100 degrees. Tongue pale, almost as colorless as his face, and furred in the center; gums pale and bloodless; conjunctiva a light yellow, not congested. Patient complains of dizziness in his head. Has been placed under the influence of quinin and has taken about 20 grains during the day.

October 20, 8 A.M. Complains of pain in head, back and lower extremities. Presents the appearance of great anemia about the lips and face, although the surface is now somewhat congested, and the patient has high fever. Pulse 104; respiration 22; temperature of axilla 104.5 degrees; 7 P.M. Patient complains of pains in all his bones. Urine contains no albumen. Pulse 112; respiration 26; temperature of axilla 105.4 degrees. Has taken 10 grains of sulphate of quinia at 10 A.M. and at 12 M. (20 grains in all) without any apparent effect upon the fever. Ordered 20 grains of sulph. carbolate of sodium, every three hours during the night, until 60 grains are taken. Ice, brandy and carbonic acid water and iced milk.

October 21, 8 A.M. Complains of pain in head, back and extremities; capillaries of eyes and surface congested; conjunctiva and surface generally present a yellow jaundiced hue. Urine contains no albumen, light colored and abundant. Pulse 80; respiration 16; temperature of axilla 100 degrees. As there appeared to be a remission in the fever, ordered 3 grains of sulphate of quinia, every three hours, until 24 grains are taken. Continue fragments of ice, carbonic acid water and brandy and iced milk. 7 P.M., the quinin has not prevented the rise of the fever. Pain in the head and bones continues. Pulse 90; respiration 22; temperature of axilla 103.7 degrees. Continue sulpho-carbolate of sodium, ice, brandy and carbonic acid water and iced milk.

October 22, 8 A.M. Patient restless; slept not at all during the night. Complains of pain in right side in region of liver. Capillaries of surface congested, but tongue and gums anemic, great prostration, patient desponding, depressed and restless. Pulse 96; respiration 22; temperature of axilla 103 degrees. Continue sulpho-carbolate of sodium. 7 P.M. Pains in bones and extremities continue. Pulse 86; respiration 24; temperature of axilla 104 degrees.

October 23, 8 A.M., capillary congestion increasing. Complains of pain in right side; loss of appetite, nausea and restlessness. Pulse 94; respiration 23; temperature 100.9 degrees. 7 P.M., pulse 80; respiration 26; temperature 104.5 degrees.

℞ Quinia sulph . . . . . gr. xx.

Divide into four powders; one powder every three hours

October 24, 8 A. M. Capillary circulation very imperfect. When fingers are pressed upon the purplish congested surface a white mark is left into which the blood slowly returns. Conjunctiva yellow and congested. Intense jaundice. Spirits greatly depressed; restless; complains of pain in right side. Pulse, 94; respiration, 21; temperature, 100.4.

℞ Sulpho-carbolate of sodium . . . . . ʒi

Divide into three powders; one powder every three hours

℞ Quiniae sulph.; pulv. rhei . . . . . ãã ʒi

Mix; divide into two powders; one powder every two hours.

7 P.M., pulse 70; respiration, 20; temperature of axilla, 102. Breath very offensive. Body emits a foul odor.

October 25, 8 A. M. Bowels constipated, breath and odor of body very foul. Complains of pain in both sides and abdomen. Epigastrium and abdomen generally very tender on pressure. Tongue, gums and lips anemic. Surface of face, trunk and extremities purplish yellow. Conjunctiva congested and very yellow. Tongue white and furred at center; large with edges indented by the teeth; this condition of the tongue is attributed to the preceding action of malaria. Urine loaded with albumen and biliary matters. Pulse 78; respiration 22; temperature of axilla 101 degrees.

℞ Quinia sulph.; pulv. rhei, ... ãã ʒi

Mix; divide into four powders. Take one powder every three hours.

Continue sulpho-carbolate of sodium with milk, brandy and ice as before.

At 7 P. M. the rhubarb has caused small action in the bowels, and the patient says that the pain in the side and bowels is much less and that he feels better. Pulse 70; respiration 19; temperature of axilla 101 degrees.

October 26, 8 A. M. Pulse 93; respiration 24; temperature of axilla 100.5 degrees. The quinin appears to have reduced the temperature, and the action on the bowels caused by the rhubarb appears to have afforded much relief. Continue sulpho-carbolate of sodium, 20 grains every four hours. 6 P. M., pulse 71; respiration 25; temperature of axilla 99.2 degrees. The patient vomited his food about 4 P. M. Continue brandy and iced milk.

October 27, 8 A.M. Pulse 72; respiration 20; temperature of the axilla 99.6 degrees. Great capillary congestion; deep jaundice, nausea and vomiting. Continue sulpho-carbolate of sodium. 7 P. M., pulse 62; respiration 18; temperature of axilla 99.2 degrees. Urine scanty and loaded with albumen casts, granular matter, excretory cell and biliary matter.

October 28, 8 A. M. Patient presents a fearful appearance; great capillary congestion, with yellow and purple surface. Yellow congested eyes, urinary excretion scant and loaded with albumen and casts. Has vomited curdled milk streaked with dark flakes. Pulse 60; respiration 16; temperature of axilla 97.2 degrees. The pulse, respiration and temperature give no indication of the extreme danger of this case. Continue sulpho-carbolate of sodium, 20 grains every three hours; ice water injection to rectum; iced milk; brandy and carbonic acid water; ice bag to epigastrium. Black vomit. Notwithstanding the occurrence of black vomit and the great capillary congestion of the surface, the tongue and gums still continue pale. 7 A. M., pulse 58; temperature 99.1 degrees. Vomiting of black vomit continues. The ice-cold enema appeared to restore the action of the kidneys temporarily. Continued to throw up black vomit during the night.

October 29. Died at 6:30 A.M.

The following table presents the relations of the pulse, respiration and temperature:

Date. 1893.	Pulse.		Respiration.		Temperature.	
	M.	E.	M.	E.	M.	E.
Oct. 18 . . .		92		26		101.5°
" 19 . . .	66	72	22	20	99.5°	100.0
" 20 . . .	104	112	22	26	104.5	105.4
" 21 . . .	80	90	16	22	100.0	103.7
" 22 . . .	96	86	22	24	103.0	104.0
" 23 . . .	94	80	23	26	100.9	104.5
" 24 . . .	94	70	21	20	100.4	102.0
" 25 . . .	78	70	22	19	101.0	101.0
" 26 . . .	93	71	24	25	100.5	99.2
" 27 . . .	72	62	20	18	99.6	99.2
" 28 . . .	60	58	16	20	97.2	99.1

Necropsy.—Three hours after death. Body still warm; weather cold and frosty; temperature of cavities of heart 97.0 degrees. There had evidently been no rise of temperature after death in this case. Ex-

terior: Deep yellow color. Conjunctiva of eyes yellow. Dependent portions of body mottled. Surface presents the appearance of great capillary congestion. Lips and gums pale and of the same color as the skin of the face. Tongue also pale and bloodless. Throughout the illness of this patient the tongue has been very pale, and I called the attention of my medical students to the effects of the preceding malarial disease, in rendering the blood watery, and in affecting the color of the tongue. The appearance of the tongue in this case was decidedly different from that of uncomplicated yellow fever.

Thorax: Recent pleuritic adhesions in the lobes of the right lung; the patient during life had complained of pain in right side, as well as in abdomen. Dependent portions of both lungs much congested. We have in this pleuritic inflammation, proof that inflammation may arise, in a system depressed by the action of the poisons of malarial and yellow fever. Heart: Cavities distended with dark fluid blood. When abstracted, the blood from the heart formed a loose voluminous soft coagulum which did not completely gather up the colored blood corpuscles. Reaction of blood neutral. Red blood corpuscles greatly diminished; colorless corpuscles very abundant. Under the microscope some of the colored corpuscles presented a crenate stellate appearance, but the vast majority were normal in appearance. After prolonged and careful microscopic examination with magnifying powers ranging from 420 to 1050 diameters, I was unable to discern any bacteria, or living animalculæ in the blood of the heart. Blood thin and watery. Serum golden colored. Muscular fibers of heart, pale and of a yellow color. Upon microscopic examination, the transverse striæ of the muscular fibrilla are to me indistinct, and granular matter and oil globules were numerous; but the amount of oil and granular matter appeared to be less than in uncomplicated cases of yellow fever. The patient was anemic and emaciated before the attack of yellow fever.

Abdominal cavity: Liver. This organ presented on the exterior a bronzed and mottled color, resembling a liver of malarial fever, which was in the early stages of fatty degeneration. The general appearance of this liver would lead the superficial observer to repeat the assertion which unfortunately has been too often made by those who have enjoyed every opportunity to crush the error, "*that there is no characteristic lesion of the liver in yellow fever, and that this disease has no pathology.*" The surface of the liver presented a mottled color of bronze and deep yellow. Many of the lobuli presented a deep yellow color, like the liver of uncomplicated yellow fever. When sections of the liver were carefully washed, the distinct deposit of yellow fever was everywhere discernible and the more deeply colored portions were chiefly in the peripheral capillary network of each lobule. Under the microscope the liver was found to be loaded with oil globules and yellow granular matter, and also with numerous masses of hematin, deposited chiefly in the peripheral system of portal capillaries. The peculiar color of the liver, therefore was clearly referable to the combined action of yellow fever and malarial fever. The presence of the pigment particles revealed the previous action of the malarial poison. Gall bladder flaccid; contained no bile, and only a small quantity, about twenty drops of a thick cream-like semi-liquid substance; which also filled and obstructed the gall ducts under the microscope. This was found to consist chiefly of desquamated epithelium from the mucous membrane of the gall bladder. Mucous membrane of gall bladder, thickened and intensely congested, presenting a deep red and purple color. Spleen enlarged and softer than in uncomplicated yellow fever. This organ contained much pigmentary matter.

Kidneys: Congested. When sections were made and washed, the kidney structure presented the characteristic yellow color of yellow fever. Sections with Valentine's double-bladed knife, under the microscope, presented the usual appearance of Malpighian corpuscles and tubuli uriniferi impacted with oil globules, granular matters and detached cells.

The urinary bladder: Contained about one fluid drachm of turbid yellow urine, loaded with colorless corpuscles, casts of the tubuli uriniferi, detached excretory cells from tubuli and pavement epithelium from pelvis of kidney, ureter and urinary bladder.

Spermatozoa: The urine contained albumen. I have observed spermatozoa in the urine of several cases of yellow fever after death.

Stomach and intestinal canal: The stomach contained about one pint of a mixture composed of milk and black vomit. A portion of this milk soon coagulated. Under the microscope the contents of the stomach consisted of the oil globules of the milk, masses of hematin, detached cells from the mucous membrane of the stomach and also the spirules and matters of a delicate fungus resembling the torula, which is very common in the black vomit of yellow fever. I have frequently observed the same fungus in the urine of yellow fever, after it has been allowed to stand for a certain time. The sulpho-carbolate of sodium did not prevent the formation of this fungus. The mucous membrane of the stomach congested and ecchymose. The mucous membrane of the ileum and colon greatly congested, presenting a brilliant injected appearance. In portions the mucous membrane was softened, eroded and covered with effusive blood.

The peritoneum exhibited evidences of recent inflammation. The omentum was intensely injected. Coagulable lymph of a yellow color and in some places of a red color was thrown out in small amounts upon the surface of the peritoneum. The inflammation of the pleura and peritoneum in this case may have been excited by the cold weather and the sudden changes of the temperature of the ward, in which the stoves had not been erected.

In the preceding case, we have a complication of diseases, namely, malarial fever, yellow fever, pleuritis and peritonitis.

It is a matter of great moment to determine whether the malarial poison under any circumstances induces fatty degeneration of the heart, liver and kidneys. If the malarial poison acted in a manner similar to that of yellow fever in producing fatty degeneration of these organs, a strong argument could be established for the identity of these two diseases in their origin and manifestations. I have endeavored to investigate this question thoroughly, by carefully observing the individual cases and noting the chemic and microscopic changes after death, in the blood and different organs, and especially in the liver, spleen, kidneys and heart. In no instance have I observed the production of fatty degeneration of the heart, liver and kidneys in malarial fever. All

the various forms of malarial fever have been subjected to critical investigation, including remittent fever, pernicious, malarial or congestive fever, malarial hematuria, quotidian, tertian and quartan intermittents and chronic malarial poisoning.

If in any condition, fatty degeneration of the heart, liver and kidneys results from the action of the malarial poison, it should be most clearly shown in prolonged cases of malarial poison. I selected the following from a large number of similar cases:

Case 1.—Chronic malarial poisoning, anemia, destruction of colored blood corpuscles, high temperature, fatal issue. Samuel Erhart; age 35; native of Germany; entered ward 13 Nov. 22, 1873, in a feeble depressed condition, with continued fever and sallow greenish-yellow complexion. Has been in America about eight months. In Europe his profession was that of an architect, but during his residence in America he has worked as a laborer in the low swamp lands of Louisiana. About eight weeks before entrance into the Charity Hospital, had a chill followed by fever, which has remitted occasionally, but has never been entirely absent. During his sickness has had scant supplies of food, and has had little or no medical attendance. The effects of the action of the malarial poison are manifest in his pale, sallow, greenish-yellow surface, pale lips and gums, muscular and nervous prostration, continuous febrile excitement, bloated countenance and swollen extremities. His present condition Nov. 22, 1873, is clearly referable to the action of the paludal poison of the swamps, bad diet and neglect.

November 23, patient pale, anemic, rapid pulse, high temperature. Nausea and vomiting of bilious matter. Quinin is retained with difficulty on the stomach and the patient takes little or no nourishment. November 24, A.M., temperature of axilla 105 degrees; pulse 112; respiration 21. Urine high-colored, but free from colored blood corpuscles and albumen. Chlorids greatly diminished. Nausea and jaundice. Great nervous and muscular prostration. 8 P.M., temperature of axilla 104.7 degrees. November 25, A.M., temperature of axilla 103 degrees, pulse 116. 8 P.M., temperature 104 degrees; delirious. Strength failing. November 26, A.M., temperature 102 degrees; P.M., temperature 103 degrees. Notwithstanding the great prostration of the patient, the fever still continues. We observe in the record of temperature no decided decline of the fever, but only fluctuations which correspond with those of the so-called bilious remittent fever. The disease has evidently run into this continued stage from the absence of all remedial agencies. It was impossible to produce any impression upon this patient by means of quinin, administered either by the mouth or rectum. November 27, patient died at 6 A.M.

Post-mortem, three hours after death. Body warm, limbs flaccid. Exterior, of dingy greenish-yellow color. Lower extremities edematous.

Thorax: The pericardium contained about two fluid ounces of golden yellow serum. Heart presented a deep color and firm texture. Under the microscope, no textural changes were observed in the muscular fibrillæ of the heart, and the microscopic characters, as well as the chemic constituents, were wholly different from those of yellow fever. Examination of the blood from the cavities of the heart: Light yellow fibrinous concretions were observed in both cavities. The fluid blood from the cavities of the heart, when viewed by the microscope was found to contain a large number of dark masses of hematin of various sizes, from one three-thousandth of an inch to one seventy-five hundredth of an inch in diameter. These masses were similar in all respects to those observed in the spleen and liver. Specific gravity of blood from cavities of the heart, 1021; solid residue in 1,000 parts of blood, 73.00. Specific gravity of serum of blood, 1015; solid residue in 1,000 parts of serum, 58.00. The fluid blood from the cavities of the heart coagulated after abstraction, and numerous oil globules were observed upon the surface of the coagulum. Coagulum large and soft; fibrin diminished in amount. Lungs normal; hypostatic congestion of dependent portions of lungs. Stomach distended with gas; mucous membrane pale and anemic. Stomach contained partially digested food discolored by bile. Liver enlarged and hardened; deep slate color on the exterior and bronze within, and contained numerous black pigmentary particles, deposited chiefly in the peripheral network of the portal capillaries. Spleen enlarged and softened and loaded with altered blood corpuscles and dark masses of hematin. Gall bladder flaccid and contained about fifty grains of thick mucus, which was loaded with the desquamated cells of the mucous membrane of the gall bladder. Kidneys normal, with the exception of slate-colored spots, about one and one-half inches in diameter, on the surface of each kidney; and when thin sections of the discolored portions were examined under the microscope, the discoloration was found to be due to the deposit of black pigmentary particles in the capillaries.

(*To be continued.*)

THROMBOSIS.

Remarks made at the Opening Exercises of the College of Physicians and Surgeons, Boston, Sept. 19, 1894.

BY E. CUTTER, M.D.
NEW YORK.

HEART CLOTS OR THROMBOSIS.

Practically this subject is in my line of genealogy, as my father, Dr. Benjamin Cutter, died of thrombosis; in my line of clinical morphology, as it includes the detection of the pre-thrombic or embolic state, and in the line of applied medicine, which teaches that thrombosis is caused by soured food and is curable by diet, mainly, an American idea practically proved.

The subject has been studied much and well. I own a Latin essay on the polypi of the heart, published in 1729, at Jena, and read before a critical audience, including Dr. Hermann Frederick Teichermeyer, President of the Medical College, by Dr. John Christian de Winterbach, as his inaugural thesis for the doctorate of medicine. Not a bad custom for to-day! The essay is short, but deep and creditable now. It shows that fibrinous concretions in the heart and blood vessels have been observed from Galen down. By Altinus, Antipater, Andreas, Bonetus, Lithias, Malpighius, Mangetus, Morgagni, Pacchionius, Pichlius, Peyer, Smith and others; that some deny this, *i. e.*, that they are formed in life; that Malpighius admits that the fibrin of the blood is the substance of the polypi, "*Polyporum origo est coagulatio sanguinis;*" that acid is the prime cause of the coagulation, "*Causa coagulationis primaria acidum est*," and that the diet must be attended to in the cure.

In 1862, Sir B. W. Richardson, in London, gave me his monograph on fibrinous concretions of the heart. Going to Washington I found that the Army Medical Museum was destitute of such works and I delighted the Librarian, my friend, Surgeon J. J. Woodward, by the gift of my copy to the library. Sir B. W. Richardson wrote learnedly, exhaustively and originally, made many vivisections and *post-mortem* experiments. He thus found that clots were formed during life. He actually drew them from the beating hearts of dogs just before death! Says this distinguished

author: "I am not without hope that the day may come when science shall show us how the dissolution of these concretions may in some cases be effected, for I have seen them partly dissolved as an effect of alkalin treatment."

Later, in the admirable "Medical and Surgical Memoirs of Prof. Joseph Jones, M.D., L.L.D.," of New Orleans—which ought to be in every American medical library, as they are comprehensive, encyclopedic, intensely graphic and unprovincial—we find this subject treated at length, two cases given where Professor Jones diagnosticated cardiac thrombosis before death and verified by autopsy. If this is a fair sample of his clinical teaching the New Orleans medical students have had fine instruction from this prince of clinicians.

Dr. Jones quotes the following authors who affirm the existence of thrombosis in life: Altinus, Andral, Baillie, Cloquet, Sir Astley Cooper, Crewell, Crompton, Dessault, Duncan, Gaspard, Graham, Hewson, Hodgson, Jones, Kirkes, Langstaff, Lee, Lobstein, Louis, Meckel, Martel, O'Halleran, Otto, Paget, Petit, Rokitansky, Richardson, Stengel, Mackrah, Tiedmann, Virchow and Wardrup. Dr. Jones italicises Dr. Richardson's words that "the diagnosis must rest upon the general symptoms rather than the physical."

Dr. Woolridge, a late English author on coagulation of the blood, comes down to 1890. His experiments are not clinical and mostly refer to *post-mortem* blood. He does not take into account the morphology of the blood in the pre-thrombic stage. He throws no light on the cure. His work is rather that of the physiologic laboratory chemist: careful, ingenious, strictly original, but gives no aid to those who treat thrombosis.

From what has been said about acid clotting blood, is it not strange that none of those gentlemen named, thought of feeding animals on acidulated foods, to see if thrombosis did not result? But it happens that thousands, if not millions, of American animals are fed on accidulated food, and that the diseased action of such foods has been studied in America.

In 1858 Dr. Salisbury (see "Alimentation and Disease," J. H. Vail & Co., New York, 1888) worked up this subject. Some of his results were briefly as follows: Of 104 swine fed on rum distillery swill till they died, 104 had thrombosis, embolism and vinegar yeast in the blood as shown by microscope. Vinegar and alcoholic yeast were found in the digestive organs; 103 had thrombi of the heart before death; 15 of these had them dislodged as emboli. The speaker testified that he had seen cases of swine fed on swill with like *post-mortem* concretions, and confirms these statements.

Where there is thrombosis, skeins of fibrin filaments, massive and large as compared with the normal fibrin filaments—are found in the blood before death and during life. They are single, double, multiple, straight, twisted, in bunches like skeins, like balls of twine, sometimes in balls of fibrin inclosing gravel like plums in a pudding. I once saw a lady just before confinement whose blood was quite full of skein-like silk threads—thus diagnosticating the pre-embolic state. By dieting these were removed before her labor, which her attending physician said was the most normal one he ever attended!

The treatment consists in withdrawing foods that are undergoing or will undergo vinegar fermentation, and substituting foods which do not undergo this acetic acid fermentation. Beef and mutton are such foods.

It will not do to deny these facts as some deny, for example, the existence of the one seventy-fifth inch objective. The only way to disprove is by like observations conducted under like circumstances.

It is my hope in the coming season to develop the clinical morphologies as applied to these diseases of the heart and blood vessels, and to make these statements clearer by means of solar projections direct from typical cases, than they can be in these few brief, hurried practical remarks.

A CASE OF SARCOMA OF THE RIGHT SUPRA-RENAL BODY CAUSING OBSTRUCTIVE JAUNDICE IN AN INFANT.

Read before the Chicago Pathological Society, Oct. 8, 1894.

BY FRANK B. EARLE, M.D.,
AND
GEORGE H. WEAVER, M.D.
CHICAGO.

CLINICAL HISTORY.

Georgie L., born Jan. 9, 1891, the only child of robust parents free from disease of all kinds. From birth the patient was extremely anemic; never grew strong but was exceptionally free from the disorders of babyhood and was regarded a healthy child until he was past 2 years old. In February, 1893, he became jaundiced, which increased rapidly, accompanied by clay-colored offensive stools, increased anemia, emaciation and rapid loss of strength. In less than a month, the liver was enlarged to such an extent that it reached below the umbilicus, one-half the distance to the pubes. The gall bladder, greatly distended, was easily felt as a firm body. Pressure on the adjacent organs was so great that vomiting continued incessantly and almost no food was retained. The dyspnea was so troublesome that the recumbent posture was almost impossible.

At this time the patient was seen, separately, by Drs. C. W. Earle, Christopher and Fenger, and each made a diagnosis of malignant disease of the liver or behind the liver. The child was placed on increased doses of pot. iod., and iron was given in full doses.

Much to the surprise of all he gradually improved, so that in May he was able to go into the country. Frequent reports of continued improvement were received, notwithstanding the fact that the patient suffered from several severe attacks of epistaxis. When he returned in the latter part of October he had gained in flesh, improved in color, and was playing about with almost as much vigor as a perfectly healthy child. The liver had decreased to one-half its former size, and the jaundice was scarcely perceptible. General improvement continued until December, when the urine became scanty and a condition of general edema developed. It was the most extensive edema I have ever seen, but lasted only a couple of weeks. By the middle of January the child appeared as well as before the attack. He was seen occasionally at the office during February, March and the early part of April and had good appetite, was digesting his food; feces normal in color and consistency. He was again gaining flesh and making blood. On April 18 he again became rapidly edematous, was unable to sleep, developed a typhoid state—temperature 103—and expired suddenly on April 23. The treatment was tonic and alterative; pot. iod. was taken for a long time and tonics all the time. Dr. Weaver will speak of the *post-mortem*.

AUTOPSY.

Nine hours after death. Body emaciated, skin pale yellow, rigor mortis fairly developed. The examination was limited to the abdomen. The peritoneal cavity contained one pint of clear serous fluid. Surface smooth. The stomach was small and the intestines macroscopically normal. The mesenteric lymph glands were slightly enlarged. The spleen was about the size of a normal organ in an adult; dark purple

surface and fairly tense capsule. The section showed a dark-red color, with a distinct increase in the fibrous tissue. The follicles were not distinct. Pancreas about normal in appearance. The kidneys were larger than normal, pyramids red, cortex yellowish with very indistinct markings. The liver reached from the second interspace on the right side, and the third rib on the left, to two inches below the costal arch on the right side, and one and one-half to two inches below the ensiform cartilage in the median line, causing a displacement and compression of the stomach. The surface was olive-green in color and finely granular. The edges were rounded. Both lobes were alike. The organ cut with difficulty, grating under the knife like dense fibrous tissue. The section was olive-green in color, the periphery of the lobules being paler than the center.

The gall bladder (*f*) measured three inches by one and one-half inches. It was tensely distended with clear, colorless watery fluid. The fundus projected one inch beyond the border of the liver *in situ*. The cystic duct was completely obliterated except

Examples of the different varieties of cells in the tumor and a small blood vessel.

one-fourth of an inch at its upper end (*d*), becoming lost in a dense firm mass at its lower portion (*b*). The lining of the remaining portion of the duct was slightly rough. The hepatic duct (*c*) was pervious throughout. At its lower portion it was much compressed and only possessed a fine caliber. On this part where compressed by the surrounding dense mass, the wall of the duct appeared thin and fibrous with its inner surface uneven. The portal vein was surrounded by the same dense mass but, while compressed, was patent. The mass above referred to (*a*)was found to consist of the altered suprarenal body. It lay behind the vessels and ducts in the portal fissure and they were fitted into it. The upper portion was three-fourths of an inch to an inch in diameter; dense, white, and fibrous on section. The cystic duct at its lower portion was lost in it. The lower portion of the gland was flattened, resembling a little more a normal adrenal. On section of this portion the tissue was yellowish-brown with a small central soft portion of darker color. The whole gland was three inches long. A few enlarged lymph glands were seen in the fissure above the adrenal.

MICROSCOPIC EXAMINATION.

The liver was cirrhotic, corresponding to the condition brought about by chronic obstruction to the outflow of bile. The portal lymph glands were the seat of old hemorrhages. No tumor growth was found in them. Sections were made from various parts of the adrenal body. Those from the parts not occupied by the firm, dense formation were as follows: At the outer part of the section was a zone which consisted of small round cells with numerous well preserved red blood corpuscles scattered among them. In a few places the cells were more of a fibrous character and formed fine meshes. There were few blood vessels in this portion of the section and they were filled with blood. The central portion of the section was unstained by hematoxylin. It contained abundant granular blood pigment in the most central part with very much deformed red corpuscles. Between this central area and the outer zone of stained tissue, above described, was an unstained zone, in which were seen red blood corpuscles variously disintegrated making up most of the picture, and among them a few large unstained cells with faintly visible nuclei. These large polygonal cells were probably necrotic suprarenal cells in an area of hemorrhage.

Section from tumor of the supra-renal body.

The section through the dense fibrous portion of the suprarenal body presented every appearance of a mixed-celled sarcoma. The cellular elements seemed to be entirely spindle-formed or only slightly varying from that, the apparent varieties of shape in the cells being due to the direction of the section through them. The cells were arranged in imperfectly defined bundles and were consequently cut in various directions and at various distances from the center, giving the appearance of oblong, polygonal, and larger and smaller round cells. The nuclei were also on this account at times cut so as to present a larger or smaller round form. When cut parallel to the long diameter, the cells were always spindle-shaped, and had oval or oblong or spindle-shaped nuclei. The size of the cells varied from that of cells found in ordinary small-celled sarcomata, to very large ones (Fig. 1) with a length equal to the diameter of ten to twelve red blood corpuscles. The most were about midway in size between the two extremes (Fig. 2). The varieties were quite uniformly mixed, but the large cells were more numerous in some areas, and in some portions of the sections only the smaller cells were seen. The smaller and medium-si zed cells

had a single elongated nucleus located in the center of the cell. The nuclei of the large cells were oblong, being about of the diameter of a leucocyte in thickness and three times as long as thick. They stained deeply with hematoxylin and usually lay to the side or at the end of the cell. They were usually single, but some cells contained from two (Fig. 3) to four nuclei. The body of the large cells was usually homogeneous, but in a few was slightly granular, and in a very few there was the appearance of vacuoles (Fig. 4) of various sizes. In cross sections there was sometimes produced the appearance of large oval or round cells without nuclei (Fig. 5), dependent upon the location of the nuclei in the side or at the end of the cells. The intercellular material was homogeneous, transparent and highly refractile. It was present in only very small quantity, and was continuous with the cells at their ends. There were numerous small blood vessels scattered through the tissue, having their walls entirely made up of a single layer (Fig. 6) of cells. Also a smaller number of larger vessels with a similar thin wall were found.

Sections were made to include the dense tissue and the remains of the cystic duct, and the hepatic duct at the point of greatest pressure. The ducts had lost the normal lining, only showing a few irregularly arranged cells in places. The inner surface of the hepatic duct was very irregular and not possessed of a lining mucous membrane. The tumor passed gradually into the duct walls. As the duct was approached, the tissue became more fibrous and there was a layer of mature fibrous tissue making up the duct wall, which was not infiltrated by tumor or inflammatory cells. From a morphologic standpoint the dense structure in the upper part of the suprarenal body corresponds to a mixed-celled sarcoma.

Sections from this portion were kindly examined by Prof. W. H. Welch, and he says that it is not certain that the tissue is a sarcoma, but he should be inclined to so regard it. The long duration of the clinical course of the obstruction and the outflow of bile is not what would be expected in a sarcoma, as a tumor of a larger size would usually be reached in so long a time. The complete destruction of the lower portion of the cystic duct is, however, an evidence of malignancy.

I am under great obligation to Dr. E. R. Le Count for the very accurate drawings he kindly made for me to illustrate the sections.

A CONTRIBUTION TO THE STUDY OF MALIGNANT GROWTHS IN THE LOWER ANIMALS.

Presented before the American Microscopical Society, 1894 meeting, and read by V. A. Latham, D.D.S., before the Chicago Pathological Society, Oct. 8, 1894.

BY EVA H. FIELD, M.D.

CHICAGO, ILL.

The study of disease among the animals used for food has occupied much of the time of our most earnest investigators; the horse, probably on account of his great value as a carrier, has received his share of attention, but I find that "the children's playmates," the cats and dogs, have been in a measure neglected.

There is, I think, no little danger in this fact, inasmuch as enough cases have been reported to prove that these animals are subject to diphtheria, pneumonia, asthma, tuberculosis, cancer, etc.

Historical Sketch.—Osler[1] says: "Cats are subject to a pseudo-membranous disease, and there are many cases on record in which children appear to have caught diphtheria from them." "On the other hand," he says, "I know of one case in which a cat died of angina and intense pseudo-membranous colitis and the children who nursed it did not take the disease; and of a second case in which a pet cat had coryza, difficult breathing, fever, and enlarged cervical glands and here too the children were not affected."

A case of asthma in a cat[2] was mentioned in the *British Medical Journal* in 1891.

Dr. C. Creighton[3] records a case of tumor of the mammary glands of a bitch. The double chain of glands was affected with nodular enlargements at several points, and one of the tumors was large with evidences of malignancy. He found that the microcharacteristics were identical with those of mammary cancer in the human subject. The same author[4] reports also several other cases of tumors in dogs, viz.: 1, a sero-sanguinous cyst of the neck; 2, a mucous sarcoma of the neck with a cystic interior; 3, a fluctuating tumor from the subcutaneous tissue of the hip of a dog of precisely the same structure as number 2; 4, a spindle-celled sarcoma from the head of a dog, with its center excavated into a cystic cavity crossed by a close network of cystic trabeculæ.

A very interesting paper[5] on "Cancer in Domestic Animals" by W. H. Birchmore, M.D., reports a number of cases of both carcinoma and sarcoma.

Case 1—was a chicken who sustained a fracture of the humerus which did not unite. A lump the size of an egg formed about the ununited ends of the bone. The animal died of exhaustion and on examining the tumor, which weighed 64 grms. it was found to be a large round-celled sarcoma.

Case 2.—Another, an old hen whose feet had been frost-bitten and sore, developed an encephaloid cancer as large as a pigeon's egg on the sole of the left foot. The hen died marasmic. Lymphatic glands were found to be enlarged and the tarso-metatarsal bone a mass of encephaloid disease.

Case 3—was a capon. Glands removed by the usual operation. Three months later the capon died of acute peritonitis which was caused by the bursting of a cyst containing an irritant fluid. This cyst formed part of a tumor as large as an egg occupying the place of the right testicle. The tumor was an adenoid sarcoma.

A typical osteo-sarcoma developed from an ulcerated tooth-socket of a fine setter which had been wounded in the mouth by the discharge of a gun. He reported in the same paper the case of a cow supposed to be suffering from snake-bite. There was found on the udder an ulcerated mass which proved both macro- and microscopically to be a nodular mammary cancer. He also mentioned the following cases: A large mixed spindle- and round-celled sarcoma from the lower lip of a mule, caused by the irritation of the bit. A papilloma irritated by rubbing of the bridle behind the ear of a horse, became ulcerated, and when removed was found to be a connective tissue tumor, containing nests of pseudo-epithelial cells. The same author reported[6] an account of a morbid growth in a pig's stomach. This growth was about two centimeters in length and raised one centimeter above the surrounding tissue. He does not give the form of cancer. An interesting description of a case of carcinoma of all the mammary glands of a cat was reported in the proceedings of the London Pathological Society by W. G. Spencer.[7] These tumors measured from one-half to one and one-half

inches in diameter. He says in summarizing: "This specimen illustrates two points:

1. A carcinoma of all the mammary glands most marked in the hinder ones, has grown apparently from the ducts, and secreted by the nipples an irritating fluid. At the same time the new growth had a great tendency to undergo degeneration, both in the mammæ and lymph glands. The degeneration is seen to have progressed by the breaking down cells, the nuclei of which still appear at the margin, shrivelled but staining. It is open to conjecture whether the degeneration was not a perverted production of milk by the cells of the cancer and therefore whether the term, 'caseous,' is not in this case the correct term.

2. Extension has taken place by the lymphatic leading directly to the thoracic and right lymphatic ducts. In this way the disease gained the pulmonary circulation, but it had advanced no farther. Therefore the emboli were large enough to stick in the capillaries of the lung. It would have extended to the general circulation without doubt in a short time, by the communication of the nodules in the lung with the pulmonary veins."

J. Jackson Clarke[8] mentions a case of a tumor found on a cat's lip. These are the only cases I have found recorded.

Transmissibility.—It has been stated[9] that the lower animals can not be infected with carcinoma or sarcoma from the human subject or from any animal except it be of their own kind.

Among successful experiments, we find that Dr. Hanan, of Zurich, has transferred a squamous-celled carcinoma from a rat with such a growth on the vulva, to a series of other rats. Wehr has transferred a vaginal carcinoma from one dog into the subcutaneous tissue of the abdomen of another. Eiselberg has also successfully grafted fibro-sarcoma from one rat to another. Moran reports a female white mouse inoculated with a piece of cylindrical epithelioma taken from an animal of the same species. A tumor resulted which was retarded during pregnancy but began again immediately after delivery. It will be noticed, however, that in these cases, pieces of tissue from the cancers were transplanted and the usual method of inoculation was not resorted to.

Some little discussion has taken place concerning the endemic nature of the disease, and the conditions under which it arises.

Williams says: "The augmented cancer mortality coincides with progressive population, increased national wealth and marked improvement in the general well being. In Ireland where there has been a decrease of population and wide-spread poverty, the cancer death rate has been much lower than in England or Scotland. Also, the decline in the death rate in phthisis and other tubercular diseases in Great Britain has coincided with the great increase in the cancer mortality."

At a meeting of the London Pathological Society, Mr. Shattuck cited one case in which, in a particular house in a certain spot in South Devon, four cases of cancer had occurred in different families in a few years. Haviland, from his extensive statistics has shown that those countries were particularly the seat of cancer which were traversed by rivers that frequently overflowed their banks. Fiessinger has published a paper in the *Revue de Medicine* in 1892 on this subject. He has observed a series of cases occurring in villages sometimes consecutively, at others simultaneously. He believes that such groups of cases are particularly liable to occur on the banks of rivers and in their immediate vicinity.

As a further contribution to the subject I wish to report the following recent cases:

Case 1. Cystic Round-celled Sarcoma.—The first case to which I wish to call your attention is that of a supposed abscess below the ear of a cat. A swelling appeared close to the ear and in a short time began discharging a foul-smelling purulent material. Aside from this, the animal was to all appearances healthy. The cat was chloroformed and a portion of the diseased tissue was cut out and brought to the laboratory for examination. There was a space about five centimeters in diameter where the hair had fallen out, and in the center of this space was the spot where the tumor had opened. The tissue on section, had a honey-combed appearance. No examination of the viscera was made. Viewed with the microscope this growth was found to be a cystic round-celled sarcoma.

Case 2. Scirrhus Carcinoma of the Mammary Gland.—A cat between 15 or 16 years of age was noticed to have a hard lump on one of the mammary glands, which grew steadily for about six months. The animal became very much emaciated and was noticed to cough. One evening she was found apparently suffocating, and her mistress hastened her death by giving chloroform, after which she cut out the growth including the axillary glands and brought the specimen to the laboratory for examination. On making section and examining them it was found to be a carcinoma of the scirrhus variety. As none of the organs could be obtained the case is necessarily incomplete, but from the fact that the cat coughed much of the time and finally nearly died of suffocation I think it highly probable that there were metastases in the lungs and possibly in other organs.

It is a noteworthy fact that this cat's age was equivalent to about 70 years in the human subject, and that pregnancy had not occurred for three years prior to death. The history in this case as well as in the following one is perfectly reliable, as the lady who owned them is quite a cat fancier, having from six to ten all the time, giving them close attention.

Case 3. Primary Mammary Cancer with Metastases.—A few months after the death of the cat in Case 2, a lump was noticed on the breast of another one. The animal had been picked up as a stray kitten eight years before, hence the idea of heredity can be excluded. Knowing that the other cat had had cancer, the lady allowed me to examine this one and gave me the following history: After first noticing the lump, it increased in size and remained hard for a period covering five months when she, thinking it was an abscess, poulticed it and after this it ulcerated and for ten weeks discharged a purulent substance. During this time the cat became much emaciated and after ulceration had begun, seemed to have considerable fever and thirst. Incontinence of urine was present and micturition painful, causing an outcry. The bowels were regular and paroxysms of coughing were noticed. To end her suffering, chloroform was administered. On making an autopsy, I found a hard tumor, the size of a hen's egg, in the left posterior mammary gland lying to the anterior border of the nipple which was not involved. The other mammary glands were somewhat enlarged and hard, as were also the axillary and inguinal glands. A few nodules were found on the peritoneum; the mesenteric glands were enlarged and hard; one nodule the size of a pea was found on the serous surface of the stomach, and numerous nodules on the serous surface of the intestines throughout their entire length. These growths macroscopically, do not seem to extend through to the mucous membrane of the stomach or intestines. The spleen was much enlarged and contained, besides, a number of small nodules, three white masses three centimeters in diameter and about one centimeter in thickness, over which the capsule was tense and glistening. The kidneys were somewhat enlarged and studded with numerous white nodules from five to ten millimeters in diameter to which the capsule was adherent, though otherwise it was free. The cut surface shows also, some white areas in the cortex which

NOTE.—A resumè of the theories regarding the etiology of tumors has here been omitted for lack of space.—[EDITOR.]

do not extend to the capsule. The connective tissue between the kidneys contained a bunch of enlarged glands. The ovaries were examined and found to be diseased; the right containing a small cyst and the left being firm and hard to the touch. The uterus' right horn apparently was normal, but the left contained in the center a lump about the size of a filbert. On opening the thorax, the anterior mediastinal glands were found enlarged and hard. The parietal pericardium contained several small nodules. The heart on the cut surface revealed a nodule three millimeters in diameter in the apex. The lungs were enlarged, completely filling the cavity, but were removed with ease, there being no adhesions. There was scarcely any of the normal lung tissue to be seen on the external surfaces, they being completely filled and covered over with nodules ranging in size from one to ten millimeters. A small area at the apex on each side was free from nodules and was markedly emphysematous. The lungs had, if examined apart from the other viscera, the appearance of miliary tuberculosis, the nodules being hard and shot-like to the touch. They were all under the pleura which showed no signs of inflammation. An examination of the brain was not allowed. However, from what I can learn there were no apparent symptoms of motor or sensory disturbance, the animal retaining its intelligence to the last.

Microscopic Examination.—As the specimens were not obtained until a number of hours after death, the material was only hardened in alcohol and Miller's fluid and was cut by freezing.

Primary Growth.—Sections stained with logwood and examined with low power, showed over the surface a very thin layer of epithelial cells much flattened in appearance and taking a very deep stain, in some places only a fine dark line being visible. Running down from the superficial epithelium are a few hair follicles, sebaceous and sweat glands, the greater number of which are surrounded by a zone of round-celled infiltration. Other evidences of inflammation are present, for in the connective tissue lying immediately beneath the epidermis, a large area of granulation tissue occurs in which we see connective tissue fibers and cells, the latter being for the most part fibroblasts and may be seen varying in shape, from round and oval to elongated cells with prolongations. A large number of blood vessels are also found in this area, one being cut lengthwise so it can be traced for about four inches. The capillaries may be easily distinguished from the newly forming vessels by the former containing blood as do nearly all the larger vessels. Below this area we have the fibers forming themselves into a stroma, in some places very delicate with very small alveoli, in others much thicker and the alveoli larger. These all contain epithelial cells of the glandular variety, and many of them are seen to communicate with each other through openings into the stroma which is exceedingly vascular.

The cancer cells present a variety of appearances, some of them being round, others oval and still others cubical in shape; in size many of them might be mistaken for leucocytes, while others are as large as the cells of a squamous epithelioma; in fact, in several places collections of cells are to be seen which, both in shape and arrangement resemble the "bird's nests" of that growth.

The arrangement of the cancerous cells throughout the growth presents as great a variety of appearances, as may be seen in their size and shape. In some parts are found a single layer of cells cubical in shape, nucleated, arranged around an alveolus, and in such a place we find the central portion filled with a delicate homogeneous substance taking a very light stain; in other places the alveoli are packed with cells which seem to have lost their well-defined shape and are round or oval in appearance, some small, others very large and multinucleated, some presenting the appearance of endogenous cell division.

The blood vessels, instead of being confined to the fibrous stroma, in many places are seen to penetrate it and run in direct contact with the cells. This, our text-books on pathology say, is seldom if ever seen in the carcinomata, they even going so far as to give that as a means of differentiating alveolar sarcoma from carcinoma. Another thing noticeable about the blood vessels is their contents, the white blood corpuscles in some nearly equalling the red in number. One large vessel near the center of the growth contains both red and white corpuscles; outside this vessel wall in the connective tissue are two well-marked areas of infiltration of leucocytes, closely packed together and deeply stained, while red blood corpuscles and a few leucocytes may be seen passing from the vessel to the areas mentioned. In another vessel I find a blood clot which probably was a thrombus. Red and white blood corpuscles are present inside the lumen, the latter massed into the center; among these are some spindle-shaped cells, probably fibroblasts, and the whole is held together by a network of fibrin well seen at the periphery of the clot and attached to one side of the vessel wall. Here there are a few large cells, evidently cancer cells which seem to have invaded the wall and are passing through. In about the center of the specimen, and in all specimens examined in comparatively the same position, we find a large area of degeneration including both the stroma and cancer cells, the former seeming to have been first affected. The connective tissue fibers first assume a swollen cloudy appearance, next the corpuscles are missed, and ultimately the whole framework is lost sight of and we have, in its place, a granular homogeneous material, the exact appearance of granular cloudy swelling.

Where we find the cancer cells just beginning to degenerate, there will be occasionally a nucleus missing; the cells become swollen and cloudy and like the fibers lose their outline and we see the same appearance as in the degenerated stroma. This degeneration very closely resembles hyaline. It does not stain well with logwood but stains much better with aurantia. A number of cysts are present, varying in size, some containing cystic material, others not, and some with a little of the cystic material clinging to the wall. Some of the cysts are round, while others are very irregular in outline.

Lymphatic Glands.—The first examined was the left inguinal glands and as the other present the same appearance only the one will be described. The capsule, for the greater part of the circumference of the gland is not increased in thickness, however, in one portion the fibers seem to have separated and inclose in their network a large number of cancer cells. We also find congestion of the blood vessels in the capsule and in some places clots and well-defined fibrin are present. There is also proliferation of the spindle-shaped fibroblasts. In the gland substance we find the lymph sinuses everywhere invaded by the cancerous stroma containing the same variety of epithelial cells as are met with in the primary growth. In the center of the gland, we here met with the same degeneration as has already been described.

The Lungs.—Beginning at the pleural surface, we find the pleura neither thickened or congested, but immediately under it are numerous cancer nodules which differ but slightly from those already de-

scribed, the main difference lying in the relative amount of stroma and cancer cells; the latter being much more abundant than the former and very densely packed together. A granular *débris* similar to the degeneration described is found here and is not confined to the cancer nodules, but may frequently be seen in the alveoli, in some places entirely filling them. Aside from the cancer nodules, the lungs are found to be in a state of chronic venous congestion. The capillaries are filled with blood, the interalveolar septa thickened, the alveoli here and there containing a few scattered epithelial cells and detritus, in others being entirely filled. Some of these cells are unusually large and lie singly in the middle of an alveolus, while others are small and closely massed together.

Heart.—The heart muscle shows but little change although there is some cloudiness in places. Cancer nodules are found in the apex which are mostly microscopic in size only one being visible to the naked eye while fifteen can be counted in the specimen under examination. These nodules are without doubt the result of a recent invasion. The stroma is delicate, cells stain deeply and may be seen in large numbers infiltrating the heart muscle, the fibers of which are pushed to one side, and in some cases are replaced by cancerous stroma. Another reason for considering this a recent invasion is that there is no sign of degeneration present, but instead a rapid proliferation of tissue.

The question arises, How did this infection of the heart take place? There are three possible ways: 1, from the blood as it passed through the ventricle; 2, by the coronary or nutrient arteries; 3, by the lymph spaces in the serous covering.

The last, I think, is the most probable, as it will be noticed the growths in all the viscera lie immediately under their serous covering.

Intestines.—In the intestines we find the growth in some places directly under the serous coat, and in others between the longitudinal and circular muscle layers, the two having apparently separated to allow the cancer nodule to form there. The description need not be repeated for this specimen is microscopically the same as those already described, the position being the point most worthy of attention. The cancer does not penetrate the circular coat of muscle fibers, however, we find the mucosa considerably altered, possibly from pressure. The villi in some places are absent, in others much diminished in size.

Kidneys —Nodules are found, for the most part, immediately under the capsule, although microscopic nodules are seen as far as the medullary portion. No description of the cancerous tissue is necessary. The epithelium of the uriniferous tubules is cloudy and so swollen as to nearly fill the lumen. Nuclei are plainly visible. There is some glomerulitis present and Bowman's capsule is in many places thickened.

The Spleen only differed in that the degeneration was more advanced, as might have been expected from the size of the nodules.

The other organs, viz., uterus, pancreas, suprarenals and ovaries will not need description, inasmuch as they are identical with those already described.

The means by which this growth became so generally disseminated was probably by the lymphatics to the nearest lymphatic glands, from them it is easily traced through the thoracic duct to the circulatory system. It is somewhat strange that the liver entirely escaped inasmuch as it is generally the first one of the viscera to become involved in a carcinoma with remote metastases.

CONCLUSIONS.

1. That the malignant tumors of the human species have their homologue in the lower animals.

2. That we have in Case 3 a scirrhus cancer of the mammary gland, followed by metastatic deposits in the lymphatic glands, lungs, heart, stomach, intestines, uterus, ovaries, kidneys and suprarenal capsules.

3. Inasmuch as inoculation experiments have when practiced on animals of the same species been in a large measure successful, it seems to me that the cat will furnish us a good opportunity of studying and experimenting. If another cat having a cancer can be found, it will be an easy matter to find others to complete the experiments, and inasmuch as the three cases here reported came under observation during a little less than a year's time, one may certainly consider it as not exceedingly rare but that those animals suffering from the disease have simply passed unnoticed.

4. Greater care should be taken by parents and those who have children in charge to see that the animals they play with are free from disease. True, it is said that infection only obtains between those of the same species, still because experiments in this direction have thus far failed, we must not make up our minds that it has been absolutely demonstrated that there is no danger. It certainly is more rational to be on the safe side, at least until it has been actually proven that there is no possibility of infection.

To Dr. Vida A. Latham and Dr. Bertha E. Bush I wish to return most grateful thanks for permission to work in the laboratory and also for their kindly words of suggestion.

BIBLIOGRAPHY.

1 The Principles and Practice of Medicine, by Wm. Osler, M.D.
2 British Medical Journal, 1891, Vol. 1, p. 283.
3-4 Journal of Anat. and Phys., Vol. xiv, pp. 42-292.
5 New York Medical Journal, Vol. 38, p. 659.
6 Proceedings American Society of Microscopists.
7 Transactions Pathological Society of London, Vol. xli.
8 Lancet and British Med. Journal, May 6, 1893.
9 British Medical Journal, 1888, Vol. 1, p. 119.
10 "On the So-called Parasitic Protozoa of Cancer," by John Lindsay Stevens, M.D., and John Brown, M.D., Journal of Path. and Bact., Vol. 2, No. 1.
11 American Journal of the Medical Sciences, Vol. cvi, No. 1.
12 "A Short Record of Work Done on the Pathology of Cancer During the Last Few Years," by Saml. G Shattock and Chas. A. Ballance. British Med. Jour., 1891, Vol. 1, p. 565.
13 British Med. Jour., December, 1890.
14 "Further Researches on Parasitic Protozoa in Cancerous Tumors," by M. Armand Ruffer and H. G. Plimmer. The Journal of Path. and Bact., Vol. 2, No. 1.
15 Archiv. für klinische Chirurgie, Bd. xlvi. Dr. Geissler.

SOCIETY PROCEEDINGS.

Chicago Pathological Society.

Regular Monthly Meeting, Oct. 8, 1894.

RANDOLPH N. HALL, President, in the Chair.

DEMONSTRATION OF SPECIMENS.

DR. E. R. LECOUNT—These are some specimens that have been collected from the County Hospital morgue. This specimen of amyloid liver and kidney came from a patient who was very much deformed by some spinal trouble and also had deformed tibiæ. The only fact in the clinical history that seemed to have any bearing upon the amyloid disease was a possible rachitis in infancy and this resulting deformity in the bones; there was no tuberculosis in the lungs, no dysentery, and as far as the history showed no syphilis.

This is a slice through the spleen of a patient who died from diffuse tuberculosis. The spleen was very large, weighing about eight hundred and fifty grammes and measuring twenty-one centimeters in its longest diameter. Examina-

tion in the morgue and subsequent microscopic examination of the tissues showed tuberculosis of the lungs, kidneys, spleen and liver, and intestinal tuberculosis as well. This spleen was very interesting, as in the morgue it showed no tuberculosis to the naked eye, but on section there was noticed minute pin-point nodules, the nature of which could not be positively stated, but from the fact that the spleen was so much enlarged and tuberculosis was present in the other organs, being visible to the naked eye in the liver and kidney, it was thought that this might be minute miliary or sub-miliary tuberculosis, and this was confirmed by the microscope.

The section of the liver showing carcinomatous nodules came from a patient who had carcinoma in the stomach and secondary infiltration by direct extension to the pancreas and also this regional metastasis in the liver. In favor of the view that the primary tumor was in the mucous membrane of the stomach, was the fact that adhesions had taken place between the stomach and pancreas at points where the pancreas was not carcinomatous, while the mucous membrane of the stomach was involved at this point, and the mucous membrane was involved to a greater extent than any of the coats of the stomach.

From the patient who was the victim of such a diffuse tuberculosis there was removed this fibroid tumor from the neck. It was perfectly encapsulated, not attached to the trachea or in any way connected with the thyroid gland, lying on the right side of the neck below the ear and easily removed by dissection. Sections were taken from different portions of the tumor because it was supposed that it might prove to be a mixed tumor on account of the varying appearance; certain parts appearing hard, almost cartilaginous in consistency, others soft and apparently edematous, but much to our surprise microscopic examination showed the same histologic structure throughout. The examination of this clinically benign tumor was interesting from the fact that as far as the histologic appearance of the specimens went, one could not say whether the sections were cut from a benign tumor or a malignant tumor of the spindle-celled sarcomatous group. The tumor was lying between the muscles entirely free, that is there was not sufficient attachment to afford any clew as to its originating from surrounding structures. My thanks are due Drs. Walker and McGrew of the house-staff for the privilege of presenting these specimens.

DISCUSSION OF PAPER OF EVA FIELD.

(*See page 982.*)

DR. G. H. WEAVER—When I first saw these specimens with Dr. Latham, she spoke to me of the fact of there being more than one case of malignant disease among the cats in the house. The first case proved upon microscopic examination to be sarcoma, this case carcinoma, and there was a third suspicious case in which a hard indurated mass was located in the mammary gland. A number of cats are kept in the house. The rarity of malignant growths in animals has been explained by the fact that they die at an early age as compared to human beings, and on that account the tendency to diseases which occur during or after middle life is not marked. Experiments made so far, do not prove that cancer is contagious or even infectious. Everything done so far has been the transferring of portions of the tumor from one animal to another of the same species, with the result that they have grown. But this is a transplantation of tissue and not necessarily an infection of the animal. These cases on account of several cats being affected in the same house are interesting as suggesting a contagious element.

DR. V. A. LATHAM.—We had another cat from the same house affected by carcinoma of the mammary gland, but we did not get so complete a *post-mortem* as in the case reported. A third case was sarcoma. I have also had a case of epithelioma, with hare-lip in a cat when in the Michigan University. Miss Field looked up the bibliography but she found no recorded case of carcinoma in the cat. Bland Sutton takes up the subject of pigs, fowls and almost every one of the lower animals except the cat. The case here presented, I believe, is the first one of its kind placed on record in this country.

DISCUSSION OF PAPER OF DRS. EARLE AND WEAVER.

(*See page 980.*)

DR. J. M. DODSON—I would ask Dr. Weaver if there was anything in the symptoms which might throw light upon the functions of the suprarenal body? Physiologically it seems probable that the suprarenal body is one of the blood-elaborating structures like the thymus gland, and therefore of great physiologic importance, especially in the young. I wondered whether or not in this case, with a tumor involving that structure, any symptoms appeared which seem indicative of interference with the special function of hematogenesis.

DR. G. H. WEAVER—So far as I know there was nothing to indicate anything of the kind, but the obstruction to the outflow of bile causing disturbance of the hepatic function was sufficient to mask anything else that might possibly have occurred without that complication. An examination of the blood was made but without anything being found.

MUCINURIA SIMULATING ALBUMINURIA.

DR. J. H. SALISBURY—exhibited a specimen of mucinuria simulating albuminuria, and said: This was the case of the wife of a physician who during pregnancy had edema. An examination of the urine undoubtedly showed albuminuria with a few hyaline and some granular casts. Delivery was made with forceps, and the patient did well, except that there was more or less prostration after delivery. Before delivery there was almost complete loss of sight. I do not know whether there was an ophthalmoscopic examination, but it was understood that there was some affection of the retina. After delivery I examined the urine, and at first I assumed that there was albuminuria, as it responded to all the ordinary tests for albumen, but I noticed a cloud somewhat above the contact line of nitric acid with the urine, that is the cloud reached up higher in the urine than it should for albumen, and I concluded there was also mucin present. I therefore precipitated the mucin with acetic acid and to my surprise found that the clear filtrate gave no reaction for albumen. It is well known that mucin may simulate albumen to the extent of misleading incautious observers, but the cloud is higher up than the one produced by nitric acid and albumen and it does not, so far as I know, give any reaction upon boiling; in fact it is stated in some works that mucin does not react upon boiling. I found, however, that this specimen reacted with nitric acid close to the contact line, and also reacted upon boiling, and yet upon precipitating it with acetic acid and allowing it to stand for twenty-four hours and filtering, I then found no reaction with nitric acid. Recently, attention has been called to the fact that mucin gives this reaction and it has been suggested that it is this mucin reaction which has given rise to the assertion that there is a normal presence of albumen in the urine, and that the numerous cases in which minute quantities of albumen are found in the urine may be due to mistaking mucin for albumen.

DISCUSSION.

DR. J. M. DODSON—This question of mistaking mucin for albumen is of a good deal of interest to me, for I have known a number of blunders to be made in this matter in life-insurance examinations. I would call especial attention to the value of the under-laying method of using nitric acid as contrasted with the over-laying method. Professor Haines lays especial stress upon this. He called my attention to it not long since, and illustrated it very beautifully in a specimen of urine I was examining. The urine is placed in the test-tube and then the nitric acid is allowed to flow very slowly down the side of the tube. A sufficient degree of acidity is given to the urine above, to dissolve small traces of mucin; then too, after the contact line is formed, as the nitric acid disseminates in the urine, the mucin cloud gradually recedes toward the top of the fluid and disappears. In the specimen of which I speak there were both mucin and albumen. When the nitric acid was first introduced there was the distinct line of the white albumen cloud, which is more opaque in appearance than mucin, and above, at first blending with it, was the more opalescent cloud of mucin. Gradually that opalescent cloud receded toward the top of the liquid, the clearer line of albumen remaining distinct.

DR. J. H. SALISBURY—in closing the discussion, said: The sight has been improved but not completely restored. I should judge that the mucin must be in solution, because I get the reaction after careful filtration and this liquid seems to be entirely clear, so I doubt if the centrifugal machine would remove the mucin that complicates this case. It seems to me the principal point of importance in this case, is that, in case mucin is present if we do not precipitate it by acetic acid and so separate it, we may be in danger of assuming that there is albumen present when there is not. It seems to me that this would be especially important in life-insurance examinations.

DR. DODSON—Does not that interfere with examination by nitric acid?

DR. SALISBURY—I think not. Two or three years ago when I was examining a specimen and could not certainly decide whether it was albumin or mucin, Professor Haines advised me to precipitate with acetic acid, let it stand twenty-four

hours, filter and test the filtrate. In that case the cloud was not well marked but in this it was, and I am sure would have deceived nine out of ten observers.

DR. HALL—Is it not the instruction of Professor Haines in every examination for albumen to add acetic acid to the specimen to be sure that it has an acid reaction?

DR. SALISBURY—Yes, that is the direction in testing the urine by the heat test, unless it is already acid. If it is, the acetic acid need not be added, and may sometimes be even prejudicial. But in case it is not acid, acetic and not nitric acid should be added before boiling. A subsequent examination of another specimen of urine from this case shows the presence of a small quantity of albumen and of some epithelial and hyaline casts.

DEMONSTRATION OF SURGICAL SPECIMENS.

DR. J. L. MCCULLOM—The first case I have to report is one of intestinal end-to-end approximation. The patient, Mrs. G., 32 years of age, a French Canadian; I was called to see her June 4 by Dr. Hyleman. The history as I obtained it from the Doctor and the family was that the woman while urinating about 5 o'clock in the morning, was taken with severe pain and became unconscious. Her husband found her some time afterward lying upon the floor entirely unconscious. When she came to she began to vomit, and this continued with slight interruptions until the operation. Dr. Hyleman was called in the morning and undertook to give an enema. He introduced a rectal tube about eight inches into the rectum and succeeded in introducing a quart of water, but she continued to vomit. He gave her cathartics and I believe a hypodermic of morphia and some morphia by the mouth. I saw her a week afterward and learned that she had been operated upon two months before by Dr. Newman. Upon examination there was no tympanitis of any consequence, no marked tenderness that would attract attention to any definite locality as the seat of trouble. The diagnosis lay between intestinal obstruction and appendicitis, and we excluded the latter as there was no marked tenderness in McBurney's point. I advised immediate operation as the only possible hope of recovery, consent to which was readily given. We sent her to St. Elizabeth's Hospital and at 7 o'clock were ready to begin the operation. In opening the abdomen I followed the median line of incision. The omentum was everywhere adherent to the peritoneum and very much thickened. I incised the omentum and peritoneum with the scissors in one cut. Immediately upon opening the abdomen a very decided odor of decomposing flesh could be detected, even by those who were not very near the patient. The light was poor and everything had to be done by touch. I found in the left side of the small pelvis a tumor which appeared to fluctuate and was bound down by firm adhesions. By careful manipulation I brought to the surface, after cautiously separating it from its adhesions, a portion of the gut of a dead black color. Although I had not brought a Murphy button, fortunately Dr. Frank had provided the hospital with a set of them, and they were sterilized and ready for use. A ligature was passed at either extremity of the necrosed portion of gut and the necessary omentum quilted off with a double row of lock stitches and eleven and three-fourths inches of gut, together with the omentum included between the two rows of lock stitches excised, and the button inserted and hastily approximated, care being taken that the omental portions should come together. The gut was dropped back into place and a glass drainage tube introduced at the site of the button. The wound was then closed with silkworm-gut sutures. The next morning the patient was calling for something to eat. We put her on a liquid diet, giving her no morphia until it was time for the button to pass. She occasionally vomited slightly and these attacks grew less and less frequent. On the fifth day she passed wind by the rectum, and on the morning of the seventh day had colicky pains and a slight evacuation of the bowels. We had not expected the button to pass so soon, and an under nurse had been put in attendance on her, but the patient tells me that this seventh morning there were hard masses which she had to get rid of by introducing her finger into the vagina and forcing it out through the rectum. We watched for the button during the three weeks she was in the hospital, but none made its appearance. After forty-eight hours I removed the drainage tube and inserted gauze drainage. After twelve days the sutures were removed. Upon removing the suture at the upper angle of the wound there was a gush of greenish fluid through the opening of the drainage tube. I immediately surmised that we had a fecal fistula and was fearful of the outcome. This continued to discharge for about twelve days, and once or twice some solid feces came through this opening. But finally it ceased to discharge and the opening gradually filled up. On the twenty-second day after the operation the patient went home. In a couple of days I was sent for and found that this fecal fistula had reopened; but after ten days it healed and the woman made an uninterrupted recovery from that time on.

The next case is one of pylorectomy with gastro-enterostomy. In July I was called to see a German, 52 years of age, who had been under the care of different physicians for about a year. He first consulted a physician because he could not retain food but vomited continually. There was a history of more or less pain in the region of the pylorus for more than two or three years. Upon physical examination a well-defined tumor could be made out in the region of the pylorus. I could not get any history of hemorrhage, no coffee ground discharges by the mouth and no tarry evacuation from the bowels. I told him he might get some relief and his life might be prolonged by an operation, but it was questionable. September 1, I received word that he had made arrangements to go to the hospital for an operation. Edema had set in, in his hands and legs, and been gradually increasing for three or four months. I was not positive as to the diagnosis, there not being any hemorrhage, and the pains being rather obscure. The man was anxious for an operation, and after preparing him for several days I performed the operation on September 11, assisted by Drs. Luken, Effa Davis and the internes of the hospital. An incision was made directly over the tumor, which was found to be adherent to the abdominal wall, to the transverse colon, and to the duodenum. It was my opinion that the disturbance was very largely due to pressure upon the portal vein. The man had been reduced from a weight of 170 pounds to a mere skeleton. His pulse was 160 and sometimes even higher. By means of an artery forceps, I succeeded in freeing the tumor from all its adhesions without rupturing the stomach or intestine, Dr. Luken's fingers being used as a clamp to compress the vessels. I removed the tumor and the pyloric end of the stomach and closed the wound with running Czerny-Lembert sutures, making three layers; one for the mucous membrane, one for the muscular layer and one for the peritoneal coat. Having a long Murphy button I had expected to make an approximation without closing the duodenum, but the button was too large for the opening in the bowel, so I closed this and made an anastomosis. The patient died two hours after the operation.

The next specimen is a femur with an exostosis upon the extremity. The patient, Miss S., 16 years of age, a Canadian by birth, gave a history of having been kicked upon the knee a year previously. Some months afterward she thought she had rheumatism and was treated for three months for articular rheumatism by a prominent homeopathist, but failing to benefit her he told the family he did not know what was the matter. Dr. Newman was called in and after seeing the case a few times with him, it came under my care. I advised operation as the patient's life was in jeopardy, and she was sent to St. Elizabeth's Hospital I cut down upon the tumor at the head of the tibia and found a large mass of sarcomatous tissue. An incision was made two inches above the knee, and the limb amputated; after checking the hemorrhage with hot water the flap contracted so that it was necessary to cut off two more inches from the femur. This operation was done on May 22, and two months afterward she began to have a burning sensation in the angles of the wound. Upon examination I found adhesions to the end of the femur. A month later a sharp protuberance could be felt and I advised another operation, when the remaining portion of the femur was removed. The patient rallied promptly from the operation and was in good spirits for a couple of months, when I was called upon to prescribe for what they considered to be a cold. She was very anemic, and upon examining the chest I found the respiration very shallow and every evidence of an invasion of the lungs by the sarcomatous disease. The symptoms continued to increase until she died of suffocation on January 30, three months after the last operation.

PRIMARY CARCINOMA OF THE PANCREAS.

DR. D. W. BISHOP—I have here some specimens of primary carcinoma of the head of the pancreas, with secondary metastasis in the duodenum and liver. The specimens were sent to the college by Dr. John B. Hamilton; they were removed by autopsy from a patient at the U. S. Marine-Hospital. The specimen is quite fresh and the sections show remarkably well. They are shown simply as examples of carcinoma of the pancreas with secondary involvement of the other organs. The liver was considerably enlarged, but no measurements were made.

Proceedings of the First Meeting of the American Academy of Railway Surgeons.

Held at the Grand Pacific Hotel, Chicago, Ill., Nov. 9 and 10, 1894.

(Continued from page 954.)

During this time a skeleton program was projected and invitations extended to charter applicants in addition to a few others, to participate in the scientific work of the meeting and, with three exceptions, written replies were received and all but two surgeons in their replies, accepted the invitation. But in each instance the replies were received too late to change the program, as it was assumed on the part of the committee that where no objections were raised silence meant consent. Fortunately, however, our program as you will see is so large that the omission of a few from the same will still leave abundance of scientific work.

A galley proof of the program was sent by your committee to the leading medical journals of the United States, the majority of which either published it in full or made a suitable announcement of the meeting.

3. In addition to that, a program was prepared a copy of which, we take it for granted, is in the hands of each applicant for fellowship at this time. A copy of the program together with the following circular was sent to the presidents and managers of the railroads which, up to this time had not responded to the former circular, while a copy of the program *without* the circular was sent to those who had, in order that those who *had* replied might see that the committee was carrying out its work in good faith, and those who *had not* replied could see that the committee was in earnest and working conscientiously in the line proposed by the original circular:

AMERICAN ACADEMY OF RAILWAY SURGEONS.

Office of Chairman Committee on Permanent Organization.

COLUMBUS, OHIO, Oct. 20, 1894.

DEAR SIR:—Please find herewith inclosed the program of the meeting of the American Academy of Railway Surgeons, to be held at the Grand Pacific Hotel, Chicago, Ill., Nov. 9 and 10, 1894.

If you find the program of sufficient merit to warrant your recognition, we will be pleased to have you indicate the same by a letter to the Chairman of this Committee, informing him whether your company will agree to give a limited amount of transportation, provided such is requested through the proper officers of the company by which the surgeon is employed. The amount of transportation necessary for the coming meeting will be very small, as the entire fellowship is limited to not exceed a total of 200 in the United States, Canada and Mexico. An early reply will be greatly appreciated. Very respectfully submitted,

R. HARVEY REED, M.D., Chairman,
Consulting Surgeon B. & O. R. R., Columbus, Ohio.
W. H. ELLIOTT, M. D.,
Chief Surgeon Cent. R. R. of Ga., of Savannah, Ga.
C. K. COLE, M.D.,
Chief Surgeon Montana Central R. R., Helena, Mont.

As a result of these formal interviews with the management we are pleased to report to you that the following railroad companies controlling over 84,000 miles, out of a possible 130,000 miles having railway surgeons in their employ, responded favorably many of whom, as you will see by the letters placed on file elsewhere for your inspection are quite enthusiastic in their support of the proposed organization, provided it is controlled in the manner set forth by the original circular.

List of railway companies from which replies were received together with the mileage of their road:

Name.	No. of Miles.	Name.	No. of Miles.
Allegheny Valley	259	K. C. St. J. & C. B.	314
A. T. & S. F.	9,320	Kanawha & Mich.	167
Baltimore & Ohio	2,136	Lake Erie & Western	720
Boston & Albany	389	M. St. P. & S. S. M.	1,170
Boston & Maine	1,294	New York & New Eng.	554
B. & M. R. R. in Neb.	3,421	N. Y. C. & St. L.	513
Cent. R. R. of Ga.	1,384	N. Y. N. H. & H.	1,473
Chicago & Alton	843	N. Y. O. & W.	477
Chicago & East. Ill.	503	Northern Pacific	4,494
Chicago & Northwestern	5,066	Ore. Ry. & Nav. Co.	1,066
Chicago B. & K. C.	195	Phil. & Reading	891
C. B. & Q.	2,175	Phil. Read. & New Eng.	181
Chicago & Great Western	922	Pitts. Shen. & L. E.	182
C. R. I. & P.	3,570	Plant System	1,492
C. St. P. M. & Omaha	1,492	Queen & Crescent	1,143
C. A. & C.	177	Rio Grande Western	530
C. C. C. & St. L.	2,305	St. A. & T. H.	240
Cleve. Lorain & Wheel.	165	St. L. C. & St. P.	96
Col. Hock. Val. & Toledo	326	St. L. K. & N. W.	276
Col. San. & Hocking	271	St. Louis Southwestern	1,227
Del. Lack. & Western	882	S. P. Atlantic System	1,742
Denver & Rio Grande	1,687	Southern Ry. Co	4,399
Fitchburg	450	Texas & Pacific	1,499
Florida Central	933	T. & O. C.	357
Grand Trunk	3,510	T. A. A. & N. M.	300
Ga. South. & Fla.	382	Union Pacific	4,469
Hannibal & St. Joe	395	Wabash	1,980
Ill. Cent.	2,888	West. N. Y. & Pa	655
K. C. F. S. & M.	1,192	West Shore	512
Mex. Cent.	1,847	Wisconsin Cent.	765
			84,143

While there are quite a number of railway companies of no mean importance which have not answered to either circular, it is certainly very gratifying to note that without a single instance those who did reply were favorable to the proposed organization, and we are certainly not justified in assuming that those who did not reply were unfavorable.

4. To further assist in the permanent organization and to avoid unnecessary loss of time, Dr. C. K. Cole was requested to draw up a skeleton constitution and by-laws which was submitted to the various members of the committee, as well as others who were interested in this work, from which the Doctor has prepared a constitution which will be submitted to the Fellows of the Academy for adoption, with such alterations or modifications as in the judgment of the majority may be thought wise and prudent.

In entering into a permanent organization of this character, your committee recognized the necessity of allowing every applicant for fellowship the inalienable right of every American citizen to express his views by ballot as to *who* should be a fellow-member and associate with him in this organization. It was, therefore, thought wise to have the name of every applicant for fellowship placed on a separate slip which may be designated as a ticket, on which are two blanks opposite each name; one for "yes," and one for "no."

It is, therefore, recommended that one of these tickets be given to each formal applicant for fellowship in the proposed Academy, and at the appointed time a ballot be had whereby each applicant will be enabled to vote on every other applicant proposed for the Academy on said ticket. It is further recommended that each member write the word "yes," in the proper column, opposite each name proposed for fellowship, provided he is favorable to the same; and to write the word "no" in the proper column opposite each name of an applicant he is unfavorable to, and that it shall require at least three negative votes to reject an applicant for fellowship in the proposed Academy.

It is also recommended that the ballot be kept as secret as possible, so that no conference be held that will in any way hurt the feelings of any one who may be an honest applicant for admission, and that each ticket be placed in an envelope provided for the same and handed to the tellers whose duty it shall be to open and report the same to the Fellows in session, being careful to keep every ballot on file for reference should such be necessary.

You will observe that we have left it to the applicants for fellowship in the proposed Academy to settle how many negative votes shall be necessary to reject a member, and we would respectfully request you as members of the Association to take proper action upon the same before the ballot is taken. We would also recommend that this ballot be taken immediately following this report, in order that the fellowship of the proposed Academy may be definitely settled and those who have and who have not a right to vote in its proceedings be determined at the earliest possible moment.

It is also recommended by your committee that only those holding charter fellowship certificates, duly signed and numbered, should be entitled to a vote on permanent fellowship in the Academy, that each applicant holding such certificate should be entitled to one vote, and further, that no applicant should be permitted to vote by proxy, but must be in attendance, and when he casts his vote demonstrate his right to cast the same by exhibiting his charter fellowship certificate, which has been furnished every formal applicant for admission to the proposed Academy. If, however, a formal applicant has failed to bring his certificate with him, or has lost it, he can be identified by the roll of formal applications in the hands of the chairman of your committee. But without such identification, it has been thought wise and prudent not to permit such parties to cast a vote. It is also recommended by your committee that immediately after the election of the temporary secretary a roll call of charter members be had, as provided for in the program, and that the said secretary satisfy himself beyond a question that no one is admitted to the executive sesssions except those who are formal applicants in the proposed Academy, as it is the firm belief of the committee that this is in the

best interest of the Academy and for the maintenance and promotion of harmony and good fellowship with all concerned.

In closing, the members of your committee beg leave to express their regret at not being able to complete their work more satisfactorily, but at the same time they can assure you that under the circumstances they have tried to do their duty carefully, impartially, conscientiously, and in the interest of the promotion of railway surgery and the railway companies of this continent.

Very respectfully submitted.

R. HARVEY REED, Chairman,
Consulting Surgeon B & O. R. R., Columbus, Ohio.
C. K. COLE, M.D.,
Chief Surgeon Montana Cent. R. R., Helena, Mont.
W. H. ELLIOTT, M.D.,
Chief Surgeon Georgia Cent. R. R., Savannah, Ga.

On motion of DR. W. H. MEYERS, the report of the Committee on Permanent Organization was received and referred to the Committee on Publication, and the committee discharged.

On motion of DR. F. H. PECK, Dr. C. K. Cole, Dr. R. Harvey Reed and Dr. F. H. Caldwell, were appointed a Committee on Constitution and By-Laws.

(To be continued.)

CORRESPONDENCE.

Minutes of Ophthalmic Section—A Correction.

DENVER, COL., Dec. 19, 1894.

To the Editor:—In the number of the JOURNAL for September 15, in a report of remarks made by me before the Section on Ophthalmology, which report was published without my knowledge or revision, occurs a passage (page 419, foot of first column) so worded as to be capable of interpretation as a personal reflection on a fellow member of the ASSOCIATION. No such reflection was intended; and I am not aware that any one who heard my remarks so misunderstood them.

My argument would have been better reported thus: "The Congress is not a representative body at all. It does not invite delegates from other associations. It has a different basis of membership. Others prominent in the work of this section intend to be present at the Congress, but it has not occurred to them that delegates should be appointed from this body. Dr. Savage might be as good a delegate as we could find, but we should not appoint delegates merely because it has been suggested to us to do so. To appoint delegates where delegates were not invited would be undignified."

If possible, I should like this correction published in the current volume. Cordially yours,

EDWARD JACKSON, M.D.

Treatment of Typhoid Fever.

HASELTON, OHIO, Dec. 19, 1894.

To the Editor:—In answer to Dr. A. S. Caldwell, of Freeport, Ill., I should like to report my experience with Dr. Woodbridge's treatment of typhoid fever. I called him in consultation on October 27, last, to see the wife of a brother physician, who had been sick ten days with typhoid fever. The pulse was 120; her temperature was 104.5; rose spots abundant, marked tenderness in right iliac fossa, with enormous tympanitic distension. Her nervous symptoms were very bad; in fact, it was a typical and severe case of typhoid fever, with a feeble breath and a pulse which became dicrotic. I heard Dr. Woodbridge say in answer to the husband's anxious inquiries that he did not consider her in as much danger as he would a well person, taking the ordinary risks of out-door life. Her temperature went to normal on the tenth day of treatment and never rose above normal after that day.

I heard Dr. Woodbridge give equally remarkable prognoses in two other cases in the same family, both of which were verified by the results, both cases being cured in less than ten days.

I have since treated cases of typhoid fever by this method, without consultation, with equally wonderful results. It seems to me that the most remarkable thing about Dr. Woodbridge's treatment is the rapidity with which patients regain their strength and vigor after the temperature touches normal. J. H. BENNETT, M.D.

BOOK NOTICES.

Weekly Medical Review, Pocket Reference Book and Visiting List. Perpetual. St. Louis: J. H. Chambers & Co. 1895.

A useful annual, handy and convenient.

The Sympathetic Nervous System. A Chart. By BYRON ROBINSON, M.D. Chicago: E. H. Colegrove & Co.

This useful chart represents the careful and accurate dissection of the ganglia and trunks of the great sympathetic nerves. A numbered index in the margin gives the names of the parts displayed. The pelvic plexus has been very carefully dissected and deserves especial commendation.

Obstetric Surgery. By EGBERT H. GRANDIN, M.D., Obstetric Surgeon to the New York Maternity Hospital, Gynecologist to the French Hospital, etc.; and GEORGE W. JARMAN, M.D., Obstetric Surgeon to the New York Maternity Hospital, Gynecologist to the Cancer Hospital, etc.; with 85 illustrations in the Text and Fifteen full-page Photograhic Plates. Royal octavo, 220 pages. Extra cloth, $2.50, net. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street.

This timely volume is elaborately illustrated, and gives a clear description of the modern obstetric operations. The titles are as follows:

Obstetric Asepsis and Antisepsis (Introduction). Chapter I, Obstetric Dystocia and Its Determination; II, Artificial Abortion and the Induction of Premature Labor; III, The Forceps; IV, Version; V, Symphyseotomy; VI, Cæsarean Section; VII, Embryotomy; VIII, Surgery of the Puerperium; IX, Ectopic Gestation.

This book gives in moderate compass the details of applied principles of aseptic obstetric surgery. It is carefully written and we commend its perusal to our readers.

A System of Legal Medicine. By ALLAN MCLANE HAMILTON, M.D., and LAWRENCE GODKIN, Esq. With the Collaboration of James F. Babcock, Esq.; Lewis Balch, M.D.; Judge S. E. Baldwin; Louis E. Binsse, Esq.; C. F. Bishop, Esq.; N. T. Bristow, M.D.; B. F. Cardozo, Esq.; C. G. Chaddock, M.D.; A. F. Currier, M.D.; C. L. Dana, M.D.; G. R. Fowler, M.D.; W. T. Gibb, M.D.; W. S. Haines, M.D.; F. A. Harris, M.D.; W. A. Hornblower, Esq.; Chas. Jewett, M.D.; P. C. Knapp, M.D.; R. C. McMurtrie, Esq.; C. K. Mills, M.D.; J. E. Parsons, Esq.; C. E. Pellew; E. M. Judge; C. E. Pratt; W. A. Purrington, Esq.; B. Sachs, M.D.; F. R. Sturgis, M.D.; Brandreth Symonds, M.D.; V. C. Vaughan, M.D. Illustrated. Pp. 738. Vol. II. New York: E. B. Treat (5 Cooper Union). 1894.

We have already expressed our high estimate of the first volume of this work, and we can only reiterate what we then said, as applying equally to the volume under consideration.

The volume opens with a paper by Mr. Hornblower on the Duties and Responsibilities of Medical Experts; then follow II, Insanity in its Medico-Legal Bearings, by Allen McLane Hamilton; III, Mental Responsibility of the Insane n Civil Cases, by Judge Pratt; IV, Insanity and Crime, by B. Sachs; V, On the Relations of Mental Defect and Disease to Criminal Responsibility, by L. E. Binsse; VI, Aphasia and other Affections of Speech, by C. K. Mills; VII, The Effects of Electric Currents of High Power upon the Human Body, by Allan McLane Hamilton and G. DeF. Smith; VIII

Accident Cases, by Lawrence Godkin; IX, Mental Distress as an Element of Damage in Cases to Recover for Personal Injuries, by Jno. E. Parsons; X, Feigned Diseases of the Mind and Nervous System, by Philip C. Knapp; XI, Birth, Sex, Pregnancy and Delivery, by A. F. Currier; XII, Abortion and Infanticide, by Chas. Jewett; XIII, Genito-Urinary and Venereal Affections in their Medico-Legal Relations, by F. R. Sturgis; XIV, Marriage and Divorce, by S. E. Baldwin; XV, Sexual Crimes, by C. G. Chaddock; and XVI, Surgical Malpractice, by G. R. Fowler. There is also an appendix giving extracts from the laws of the different States and Territories of the United States which relate to the care of the insane.

One of the most interesting of the many instructive chapters is that on the effects of electric currents. The cases are cited of the criminals electrocuted in New York, and Hamilton says:

"This case and another quite recently reported in France by Arsonval, raise a grave question of how electricity kills; and whether the production of asphyxia is not what really takes place. The subject of the French case was a workman who received 5,000 volts (!) in some way and was restored to life by artificial respiration and other means. Again and again, cases 'struck' by lightning have, though apparently some time dead, been resuscitated, and it certainly is a grave question whether *post-mortem* examinations should not always be delayed until the matter of death is indisputably settled."—The article on surgical malpractice should be read by every surgeon.

Higher Medical Education; the True Interest of the Public and the Profession. By WILLIAM PEPPER, M.D., LL.D. Philadelphia: J. B. Lippincott & Co. 1894. Price $1.

In this volume of one hundred closely printed pages, are included two addresses by Professor Pepper. The first was delivered in 1877, at the opening of the one hundred and twelfth course of lectures in the medical department of the University of Pennsylvania. It presented the position of medical teaching in America at that time, pointed out its chief defects and indicated the causes which led to them and the evils to which they in turn gave rise. In the appendix to this lecture, a statement was made giving the requirements of the systems of medical education in foreign countries.

The second address was delivered sixteen years later, in October, 1893, and the occasion was again at the opening of the annual course of lectures. This time the course had been extended to four years, Professor Pepper mentioning with just pride the great advances that have taken place in the system of teaching since his previous lecture. He has the right to feel proud of its accomplishments. He justly concludes as follows:

"I have told you at great length the story of the recent changes in medical education; of the way in which we have tried to secure the reforms recognized as necessary, of the admirable results already secured in the increased renown and prosperity brought to the University, and in the gratifying success and position of our graduates. When we reflect that not at the University of Pennsylvania alone, to which I have limited my remarks, but in many other institutions, the same righteous effort for sound learning and higher education is being made and is meeting with a like encouraging appreciation, it is a proud thought that in this Columbian year we may invite attention, not only to our vast material prosperity, but to the splendid development of our educational resources; to the rapid elevation of our standards, and to the pure intellectual life so strongly fostered in many great centers as it is in this venerable University.

"We have stood on that bridge that spans the lagoon in Jackson Park and have realized, as we gazed to the right, to the left, or ahead through the stately peristyle to the great lake beyond, that we were surrounded by such triumphs of art as not even Athens, in the golden age of Pericles and Phidias, could display. That one scene will pass, its purpose having been effected; but the impression it has produced will never pass away. It has introduced a new standard; it has furnished a new inspiration; it has shown the astonished world that the fifth act of the world's great drama of empire, as sung by Berkeley, opens on no sordid scene, but on one whose noble ideals and noble opportunities await Time's noblest offspring. And to us who labor here in the departments of this great University, consecrated by the memories of the good and the wise who have lived here, consecrated also by the thousands of pure, high-minded youth who throng her halls, to us this year more clearly than before a vision arises of what she shall come to be, a vision as of temples not built with hands, where Truth shall dwell forever, and from whose glittering portals shall go out to all parts of the world knowledge for the healing of the nations."

NECROLOGY.

DR. OERGEL.—The death of Dr. Oergel, an assistant in the Hamburg Institute of Hygiene, is reported in the *Deutsche Medicinische Wochenschrift*, October 15, and was briefly noticed at the time in this journal. This was a sad case, the cause having been Asiatic cholera probably from laboratory infection. There is no positive evidence as to the manner in which the infection was accomplished, but he was daily engaged in cholera work. This is sufficient in the view of some to account for the event, but others have pointed out that Dr. Oergel may have gone counter to the rules of the laboratory. For example, some time before his death it was reported that he had been experimenting on himself with certain cholera-like vibriones from the water of the River Elbe. When he became ill he was asked whether he had to his own knowledge experimented with cholera germs also. His reply was not determinate; he said he would not have ventured to do anything of that kind, during the absence of Professor Dunbar, whose duties he, Dr. Oergel, had been detailed to perform. The attack was an excessively severe one, as judged by the very complete history of symptoms and treatment, so that there can be little doubt but that the disease was cholera asiatica, most likely contracted accidentally while handling the cultures of the bacillus of that disease in the laboratory.

The victim was yet a young man, having been born in 1864. He was for a time at Greifswald, as an assistant to Professor Löffler, but in June of last year he accepted an appointment at the Hamburg Institute. He was a man of marked ability, admirably adapted to the work of his choice, and highly esteemed by his colleagues.

DR. GEORGE A. PETERS, of New York City, who died December 6, was one of the consulting surgeons to the New York and St. Luke's Hospitals, positions that mark their holder as being of senatorial rank in his profession. Dr. Peters was the son of a clergyman. He took his degree in 1846 at the College of Physicians and Surgeons, N. Y., so that he was not far from entering upon his fiftieth year of practice in upper New York. He was not a frequent writer, but he has left behind him a valuable essay on acupressure. He had been long connected with the Academy of Medicine, and an office-bearer therein. He was a member of numerous societies and a valued consultant to several other institutions besides the two above mentioned.

C. A. BROOKS, M.D., of Americus, Ga., December 17.——W. A. Morton, M.D., of Liberty, Mo., December 10, aged 82.——J. T. McPherson, of Cambridge, Ohio, December 15, aged 70. A. B. Smith, of Geneva, N. Y., December 18, aged 75.——Dr. Foster, of Iowa Falls, Iowa, December 14.

The Manhattan Dispensary of New York.—The will of the late Mr. Hood Wright, of the old banking house of Drexel, Morgan & Co., gives to that institution the residue after certain specific bequests have been paid, and of this residue, the sum of $100,000 is to be set apart as a building fund.

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SATURDAY, DECEMBER 29, 1894.

THE SANITARY INQUIRY AS TO TENEMENT-HOUSES IN NEW YORK CITY.

A Commission, appointed by the Governor of the State at the instance of the last Legislature, has been engaged on an investigation of the evils of the tenement-house system in New York City. Public hearings have been had, from time to time, for several months. At a recent meeting it was shown that money-taking—proved conclusively to have been the order of the day in other departments—was not foreign to certain Tammany-appointed officers of the Department of Health. It was stated that one officer, concerned in the inspection of tenement-houses, stooped to take blackmail from a little boy who wanted to keep a few pigeons at his place of residence. Another case, lately brought to light, showed the "tenderloin instincts;" it was that of a poor woman, who was keeping a cow under conditions contrary to the sanitary ordinances. Her testimony showed that she had thrice paid money to an alleged officer or officers of the Board of Health, to induce him or them to shield her from complaints against the cow; and her money had, in fact, bought "protection" for quite a while.

Testimony has been received by this Commission to the effect that the tenement-house rentals in New York are about twice as high as those of London. For example, on the "East Side" of New York, the average monthly rent paid for three rooms is $11.43; for two rooms $7.86 and for one room $5.04. Another set of figures, deduced from a canvass of six hundred families, also on the "East Side," places the weekly wage earned by those families that occupy four rooms at $16.50; three rooms, $11.99; two rooms, $10.90; the occupiers of single rooms receive about $8.50 per week. So that it may be roughly stated that a fourth or a fifth part of such wages goes to the landlord. Not a few of the landlords are wofully remiss as to taking care of this class of property. In fact, a large percentage of them resist all orders for sanitary repairs until after prosecution in the courts puts a compulsion upon them. It is a felt want in New York to obtain by legislation larger powers for the municipal authorities in order to a condemnation and vacation of tenements, whose owners are wilfully neglectful of their tenants' sanitary needs. Report, to this effect, will be made by the Tenement-House Commission to the Legislature, soon to convene.

The work that has been accomplished for Dublin, in respect of a material reduction of its death rate, is claimed by SIR CHARLES CAMERON, M.D., to have been the result, in no small measure, of the systematic condemnations and vacations of fever-nests and tenement rookeries, many of which are ancient and dishonorable, dilapidated beyond redemption. The power to distenant these Dublin domiciles was obtained through special dispensation by the Local Government Board, in order to enable DR. CAMERON to make the attempt to stamp out the endemic typhus fever of Ireland's capital. The recently published experience of Dublin[1] will be ammunition for our American cities, which have unwholesome old structures that are too old and frail to warrant a bill for repairs.

One of the witnesses before the New York Commission, SANITARY ENGINEER WINGATE, testified to his belief that there should be more frequent and systematic inspection of tenement-houses, that the corps of inspectors should be much more numerous than it is, and that this corps should be composed of a higher grade of intelligence. The most desirable men can not get appointments under a Board that has been Tammanyized for years. Political misrule has compelled some of the best employés to resign, and has tainted, with a few exceptions, the system of appointments, promotions and removals. Tammany Hall has, it is true, been "downed" this year, but it may be many years before its baleful influence in sanitary affairs can be nullified. One of the reforms that needs instant proposition is that which will make it possible for a medical man to be placed at the head of the New York Health Department. A plumber or a stock-broker may, under existing laws, be its president, but the medical man is specifically ostracized in that regard.

One of the proposed amendments to the tenement-house laws is one that will forbid the construction of houses, arranged for four families on a floor, on lots that are not more than twenty-five feet wide. Another means of relief in overcrowded sections will be advanced, namely, the tearing down of buildings

[1] See page 562 of this JOURNAL for Oct. 6, 1894.

that are unfit for human habitation, and the creation of small parks in their stead; it has been recommended also that these small parks should be laid out around the public schools, for the double benefit to both neighborhoods and schools.

So rapidly as the clutch of the ward heeler can be loosed from the neck of New York City, in that proportion may be expected a purification of the tenements; and this purification will redound to the perpetuity of our American government. For, as some one has said: "Scratch a tenement-house dweller and you find an Anarchist," or the material for one. The houses that have little light and impure air are the recruiting ground "for the ranks of the socialists and anarchists. Social discontent is bred in overcrowded tenements, and these stifling places may become the incubators of mobocracy. Give the people a chance to breathe, and they will gain in tone, both physical, psychical and political." And the REV. DR. PARKHURST has recently pointed out that the polyglot populations of lower New York are not so blind to their true interests as many have believed. He says that "one of the most interesting and surprising lessons of the recent upheaval is the impression that has been made on the masses; the change of sentiment in this respect in the eastern and southeastern portions of the town during the last year is simply phenomenal." These people are poor citizens, not because they are vicious, but because they have had no opportunity to learn where their higher interests lay, and because they have seen corruption and perjury, during the rule of the bosses, "take all the honors," especially among the police and the courts of justice, so-called. Now it should not be forgotten, in this connection, that the president of the police force is an ex-officio member of the Board of Health, and appointed in the old partisan way.

INCREASE OF THE MEDICAL STUDENT CLASS.

Through the courtesy of the Deans and Registrars of 98 out of the 117 existing regular medical colleges in the United States and Canada, the JOURNAL is enabled to present some interesting data concerning the growth of medical colleges in general, and especially concerning their increasing classes. Since many of the returns were made early in November and before the enrollment was completed, the figures herewith given are below rather than above the exact numbers. Another source of incompleteness also exists in the fact that no note has been taken of newly-organized institutions; in order to institute comparisons, the colleges invited to furnish returns were limited to those listed in the last Report on Medical Education of the Illinois State Board of Health—that dated Jan. 1, 1893, and dealing with 117 institutions which gave graduating courses in 1892.

As already indicated, ninety-eight of these institutions have transmitted to the JOURNAL returns of the total number of students and of the numbers in each grade in attendance upon the current sessions and upon previous sessions covering a period, in many cases, of five years. These returns, with the comments of the reporters, will be published *in extenso* in a future number of the JOURNAL; meanwhile, the following summary statement should serve to drive the iron still deeper into the collective soul of our British brethren, who are bitterly bewailing the decadence of the medical student class, and the consequent diminishing output of medical practitioners, in the United Kingdom.

In 1892 these 98 colleges reported a total of 15,330 students out of a grand total of 18,340 in attendance at the entire 117 colleges; that is, the 98 colleges now reporting for 1893 and 1894 had 83.5 per cent. of the total attendance of 1892. For 1893 they report an attendance of 16,267, and for 1894 an attendance of 17,701. On the same basis of 83.5 per cent., the total attendance in 1893 was 19,481, and for the current sessions the total attendance is 21,186. As before remarked, this latter number will be increased on the completion of the enrollment. The percentages of increase are 6.2 for 1893 and 8.7 for 1894, and the average annual increase since 1881 has been 8 per cent., or an aggregate increase of 104 per cent. in thirteen years.

It is a little difficult to compare these figures with those of the medical schools of the United Kingdom, since the only data at hand are those contained in SIR RICHARD QUAIN'S address as President of the General Council of Medical Education and Registration at the beginning of its winter session, Nov. 27, 1894. In a table, compiled by DR. QUAIN, showing the number of medical students registered in the three divisions of the United Kingdom in the four last quinquennial periods, the following figures are given: 1874–78, total 7,540; 1879–83, total 9,931; 1884–88, total 9,604; 1889–93, total 8,696. If it be assumed that one-fifth of any one of these quinquennial totals were in attendance during any given year of the respective quinquennium, then there were only 1,739 registered students in 1893 and there had been a loss of 14.2 per cent. during the preceding ten years. But the stars and stripes—*pace* OLIVER WENDELL HOLMES—waved over a 99 per cent. increase in the same period, and the American eagle screams with delight to see an aggregate of more than 20,000 neophytes in the Temples of Esculapius during the current year.

Nor do our French *confréres* make a much better showing than the English. According to PROFESSOR BROUARDEL, Dean of the Paris Faculty of Medicine, made at the November meeting of the Council of the Academy, the total number of students inscribed on the books for 1894 is only 5,144—and of this number

1,002 are foreigners; largely, no doubt, from this country. Paris is, in effect, France; but even Greater New York is not the United States. And yet the New York medical schools to-day have an enrollment of more than 2,500 regulars and some 300 irregulars, as against the enrollment of Paris with one-fourth more population.

Congress may put tariffs up or down, or abolish them entirely; may threaten currency legislation, or railroad-pooling bills, or any other device for or against the industrial prosperity of the nation. But here is one American infant industry that thrives apace and asks for no protection. What the struggling practitioner in the already over-crowded ranks thinks of it belongs in another category.

THE ANTITOXIN OF DIPHTHERIA AT NEW YORK CITY—COST OF PLANT.

It is reported that the young medical men attached to the Board of Health of New York are bearing the expenses of the present antitoxin experiments from their own purses. They, some months ago, duly made application for an appropriation of the city's funds for the purpose, but they were denied. It is possible that money may be voted by the authorities after New Year's Day. The sum asked for and refused was $27,000; it is computed to be none too much to enable any Department of Health to maintain a station with fifty horses for one year. The first half-year mainly is preparatory, and non-productive of the remedy; although this period of delay may be reduced by certain proposed changes in the maturing of the product. The following is an estimate that has been published in New York. It may be interesting to readers in other places, where it is proposed to establish antitoxin stables. The average monthly cost for a stable, having fifty horses under cultivation, will be during the first year about $2,300. The average cost per horse, during the first non-productive half-year, will not be far from $290; in the second half-year about $250. This shows an expense account that will deter some from rushing into the field. It is already apparent that certain people are offering an immature and hurtful (because valueless) product. *Caveat emptor* must be the motto of the profession, just now.

This statement is intended to show: 1, the approximate cost of preparing fifty horses so as to render the latter available for the production of antitoxin. The period which will be necessary to effect this preparation is estimated to be about five months:

Cost of horse	$40
Cost of keeping horse (per month $25) five months	125
Total	$165
Cost of fifty horses (each $165)	$8,250
One veterinarian, five months ($100 per month)	500
Two experts, five months ($150 per month)	1,500
One helper, five months ($65 per month)	325
Apparatus	1,500
Total	$12,075

At the end of the five months the following expenses will be necessary:

Fifty horses (stabling, $25)	$1,250
Two experts ($150 each)	300
One helper	65
Apparatus	100
Loss on horses	250
Total	$1,965

It is estimated that each horse will produce sufficient serum to treat about fifteen cases per month. This is a conservative estimate, which would be for the 50 horses 750 cases per month. In other words, 50 horses would produce about 2,500 doses per month.

THE DOCTORS MOST OF ALL.

Referring to the public movement in this country in favor of good roads, the *Journal of Commerce* says that it is a mistake to suppose that only farmers are concerned in the movement for good roads. "City merchants and manufacturers," says the *Journal*, "who depend largely on the country for their patronage, are also interested, and ought to join the movement."

We might add, with much force the assertion, that the country doctor, and as well those doctors engaged in suburban practice, are as much interested as the farmers; indeed, four-fifths of the time given to practice is taken up in driving from house to house. It is therefore clear that no single class of our citizens, is more interested than the doctor, and when we consider that much of his travel is done at night, it is apparent that the doctor needs good roads more than any other. The whole profession therefore should use its powerful influence in support of all reasonable legislative enactments in favor of good roads. It is a mistake to allow such a wise and advantageous measure to drift into the custody of mere partisans or cranks, and physicians everywhere, having influence with legislators, should throw that influence in favor of this movement, for the doctor most of any, is interested.

HOSPITAL APPOINTMENTS.

Physicians in this country so commonly serve without salary or hope of reward on the staffs of our large hospitals, that it is only fair, that when a change is to be made, the Medical Board should be consulted.

A recent case in Philadelphia where a well-known physician, (DR. JUDSON DALAND) was summarily removed, without notice to himself or his colleagues on the staff, brings the matter once more to the surface.

It is greatly to the credit of the new appointee (DR. HOBART A. HARE) that he very properly and promptly declined to accept the appointment, which although complimentary to himself, he could not accept without seeming to acquiesce in the reflection cast upon his predecessor. Newspaper statements, unsustained by any investigations, reflecting upon DR. DALAND, were published after his removal, thus

adding a positive injury to the moral grievance sustained by the removed physician.

DR. HARE in thus acting up to the motto, *noblesse oblige*, has given the lay members of the hospital board a needed and useful lesson.

PUBLIC HEALTH.

Leper Home at Jerusalem.—A Moravian institution has long existed at the Holy city, for lepers. Its last annual report shows that the year was begun with twenty-eight patients, an increase of four; of these sixteen were males and twelve females. Two of them have been at the Home not less than twenty years. Six deaths occurred in the year, some of them from causes, as apoplexy, that were intercurrent with leprosy rather than secondary to it. The inmates are given light work to do, and when they consent to it, they appear to do much better physically than when they remain unemployed.

Improving Health Conditions.—In the closing week of December the reports of JOURNAL correspondents indicate a generally improving condition of the public health as compared with the month of November and with the first ten days of the present month. Although there has been some increase of smallpox since the beginning of colder weather, its anticipated epidemic spread has not taken place; on the contrary, there has been a decrease in the number of new cases in the two chief centers, Chicago and Milwaukee, as compared with November. On the 26th inst. there were 46 cases remaining in the Chicago Municipal Hospital, as against 64 on the corresponding date of the previous month; and for the same date there were 83 cases in Milwaukee—35 in hospital and 48 in homes—as against 106 in November. A similar decrease is noted in other localities. The reports also indicate a diminishing prevalence of diphtheria and typhoid fever toward the close of the month, but an increase of the death rate from pulmonary diseases, and especially from phthisis. This increase, however, does not swell the general death rate, and the closing days of 1894 show a condition of the public health which should be highly gratifying to the sanitarian, at least.

The Therapeutic Sensation of 1894.—There is nothing of scientific importance to be added to the record of the diphtheria antitoxin—the therapeutic sensation of the year now drawing to its close. Dr. Hausemann's threatened demolition of its claims proved to be a lame and impotent attack, whatever force it might have had being more than offset by Professor Virchow's own statements at a subsequent meeting of the Berlin Medical Society. Hausemann, it will be remembered, is Virchow's assistant, and it was generally believed in Berlin that the attack was made at the instigation of the Professor. But Virchow himself has now indorsed the results of the diphtheria antitoxin treatment begun last March in the Kaiser and Kaiserin Friedrich Hospital, the figures of which are as follows: In the whole space of time 533 cases were treated—303 with the serum, 230 without; the former had a death rate of 13.2 per cent., the latter of 47.8 per cent. After an analysis and summing up of the results, Virchow said he held it to be the duty of every doctor to use the serum in diphtheria. "All theoretical considerations," he added, "must give way to the brute force of these figures." He, nevertheless, pronounced the current theory of antitoxin therapeutics a fallacy, and, while recommending the serum, to which he emphatically attributes a high therapeutic value, he insists that its theoretalic explanation must be left to the future.

Phenomenally Hot Years.—The recent mild winter weather in this country somewhat breaks the force for us of the contrast which the *Journal d'Hygiene* endeavors to make in furnishing a list of phenomenally hot years as "agreeable reading now that cold weather is at hand." Among the most remarkable of these torrid years, all of which had serious effects on the public health, may be mentioned A.D. 738 when the heat was so great throughout Europe and especially in France, that nearly all the springs dried up and thousands perished of thirst. In 879 reapers who staid in the fields after midday fell dead in great numbers. In 990 nearly all fruits dried up, occasioning a great famine and an enormous mortality. In the year 1000, amidst panic fears about the end of the world, the river sources dried up and vast numbers of fish putrified, giving rise to a general epidemic; it was widely believed that the end of the world by fire was at hand. In 1132 rivers and springs again dried up and the bed of the Rhine became a dry sandy road. In 1182 the sand was so heated that eggs were cooked in it in a few minutes. The Seine, Loire, Rhine and Danube could be passed over dry-shod in 1303. All fruits withered and animals dropped dead from the excessive heat of 1393. Four years of great heat and continuous dryness, from 1538 to 1541, caused many rivers to disappear entirely, crops were failures and famine and sickness carried off large numbers. There were fifty-eight consecutive days of extraordinary heat in 1646. There was no rain from April to October in 1710; the Reaumur thermometer marked over 36 degrees; in gardens which could be irrigated fruit ripened twice. In 1818 the theaters of Paris were closed for a month on account of the heat; the thermometer marked over 38 degrees R. During June and July, 1830, the centigrade thermometers registered over 38 degrees in Paris in the afternoons.

Circular of Information Regarding Scarlet Fever.—The following is a portion of a circular of information recently published by the Brooklyn Department of Health:

"Scarlet fever, sometimes called scarlatina or scarlet rash, is a highly contagious disease, and may spread rapidly from person to person through contact or by means of books, papers, toys and articles of clothing. A patient suffering from this disease should be placed apart from the rest of the family, in a sunny and well-ventilated room, free from all unnecessary furniture and hangings, and, as nearly as possible, should be nursed by one person. Members of the family should avoid mingling with other people, and visitors, especially children, should not be admitted to the infected house. The scales from the skin are dangerous sources of infection, and during the period of peeling, the person of the patient should be sponged daily with soap and warm water. Discharges from the nose and mouth should be received on pieces of cloth, which should be burned or disinfected before removal from the sick room.

"Bed linen and underclothing, before removal from the sick room, should be placed for an hour in a solution of carbolic acid, in proportion of one pint of acid to four gallons of water. This solution is poisonous. The clothes should then be boiled in water. In no case should infected clothing be sent to a laundry.

"After recovery or death, the sick room and its contents should be thoroughly disinfected by the Department of Health or under the direction of the family physician, in the following manner: The walls, ceiling and woodwork should be rubbed with dry cloths, which should be burned without being shaken. The floor should be scrubbed with soft soap and the above mentioned carbolic solution. The room should then be fumigated with burning sulphur, 3 pounds to 1,000 cubic feet of space, for eight hours, care being taken to close the room tightly, and freely expose all woolen clothing, car-

pets, mattresses, etc., and to have steam in the room before lighting the sulphur. Books, papers and toys should be destroyed by burning. The Department of Health is now prepared to disinfect according to the latest improved methods, free of cost."

SOCIETY NEWS.

Association of Erie Railway Surgeons.—The Association of Erie Railway Surgeons will hold their annual meeting in Youngstown, Ohio, Jan. 10, 1895, under the Presidency of E. Griswold, M.D. The following papers are on the program:

The use of Alcohol in Traumatic Surgery, by Clayton M. Daniels, M.D., Buffalo, N. Y., ex-President Association of Erie Railway Surgeons.

Immobilization vs. Passive Motion in the Treatment of Injuries to the Joints, by Prof. R. Harvey Reed, M.D., Cleveland, Ohio.

Potts' Fracture and its Treatment, by Prof. C. B. Parker, M.D., Cleveland, Ohio.

Traumatism of the Ear, by R. Sayre Harnden, M.D., ex-President Association of Erie Railway Surgeons, Waverly, N. Y.

Delayed Union and Pseudo Arthrosis, by Wm. H. Buechner, M.D., Cleveland, Ohio.

Relations of Railway Surgeons to Claim Department, by W. E. Talcott, Special Claim Agent, N. Y., P. & O. R. R., Cleveland, Ohio.

The Treatment of Injuries to Fingers, by Prof. Webb J. Kelly, M.D., Galion, Ohio.

After 20 Years' Experience with Ether and Chloroform, by Henry Flood, M.D., Elmira, N. Y.

A Case of Sphacelus of Leg and Gangrene of Thigh and Inguinal Region, with remarks by E. Griswold, M.D., Vice-President, Sharon, Pa.

Some Reasons why we should have, and some of the Objections met with in organizing a Hospital System, by Emery H. Leyman, M.D., Huntington, Ind.

Tension, by S. B. Hiner, M.D., Lima, Ohio.

Opportunities of the Railroad Surgeon, by F. D. Bain, M.D., Kenton, Ohio.

MISCELLANY.

The Hartford Hospital.—Under the will of the late Henry Keney, of Hartford, Conn., the hospital of that city will receive $50,000, also a share in a contingent remainder.

Some Curious Statistics.—A writer in the Lyons *Medical Gazette* has calculated that a man at 50 years of age has worked 156,000 hours; has slept 144,000 hours; has amused himself 96,000 hours; and has been sick 12,000 hours. During this period he will have walked 19,000 kilometers and eaten 36,000 meals, including 7,000 kilos of meat, 1,800 kilos of fish, eggs and vegetables and 4,200 liters of different kinds of liquids. Apparently they don't eat three meals a day in France and 30,000 hours of an existence of 50 years are passed in a state of Nirvana.

Goitre in Asia.—In some parts of Central Asia, goitre is extraordinarily prevalent, it being estimated that over 75 per cent. of the men are thus affected, and the prevalence of the disease is attributed to the bad water. The natives account for its origin as follows: A holy man of Khotan, named Sala Paikhumber, once went to the village of Posgam on his camel; he slept there in a cave, and, on awaking one morning, found his camel gone. Upon inquiry he found some of the people of the village had killed and eaten it, whereupon he cursed them and prayed to Allah that all the inhabitants of Posgam should have huge lumpy throats like the camel they had eaten.

A Japanese Hospital.—An American officer, now on duty at the seat of war in the East, has written home an account of his visit to an Army hospital at Nagasaki. The following is a part of his report, the whole going to show that the Japanese have a remarkable faculty for the selection of "the best," when they go abroad to learn what Europe and America are doing:

"The hospital was the admiration of the French and English surgeons, as well as our own. The medical staff were all Japanese, who had graduated in medicine and surgery either in America or England, then taken a post-graduate surgical course in clinics at the Paris and Berlin hospitals. They had the best modern instruments and systems, the newest antiseptics—everything a hospital on modern lines should have. And all this is the work of a generation. Truly the Japanese is a wonderful man."

Abdominal Palpation of Obese Women.—Dr. Harris Slocum has written, in the *Philadelphia Polyclinic*, on a new method of examination of very stout females. He has found a narrow zone on the abdominal walls where the fat in the muscular layer is deposited to a less extent than at other points. He describes this as a depressed curved line running from one anterior spine to the other, with its convexity toward the mons veneris. Along and near this line little fat is lodged. By depressing the finger tips the pelvic organs may be felt, the fat about the navel and below the zone being pushed out of the way by the pressure of the hand. In this way, he says, an effective palpation may be obtained even in the most obese. He has had a satisfactory experience with it, personally, beyond that which had formerly been possible by palpation over the abdomen at large. The method can not be carried out when there is much gaseous distension of the intestines, or when the dress is tight.

Guaiacol in the Treatment of Orchitis.—Balzer and Lacour have communicated to the Hospitals Medical Society of Paris the results of their treatment of orchitis with guaiacol (*Ann. de Derm. et Syph.*) Their attention was directed to this agent on account of its sedative and antithermic action. Pure guaiacol applied in the quantity of one gram, morning and evening, causes a somewhat marked smarting sensation which, in about ten minutes, becomes a simple senses of heat lasting for a couple of hours; the pain is first relieved and then disappears completely, sleep becomes possible and the temperature falls to normal. Pure guaiacol often gives rise to erythema and desquamation of the scrotum; it is, therefore, advisable to use five or ten grams of the drug to thirty grams of vaselin. With this mixture the smarting is hardly noticeable, but the sensation of heat is the same as with the pure drug; the therapeutic effects, while somewhat less prompt, are equally satisfactory, pain is rapidly lessened, temperature lowered and sleep made possible. The ointment as a rule does not irritate the scrotum. The inunctions are made with three to five grams of the mixture, repeated twice daily, the scrotum being covered by a compress held by a T-bandage.

Nerve Supply of the Ovary.—Devosa, in order to ascertain the distribution of the nerve fibers up to their ends in the ovary, used Golgi's staining method and furnishes the results of his study in the proceedings of the Academy of Medicine of Belgium. He made use of several different animals—the dog, cat, rat, mouse, guinea pig, turtle and calf. He describes a network of nerves, which accompany the arteries, arterioles, veins and venules; but found no vasomotor system along the capillaries nor, in general, at points where there is no unstriped muscular fiber; neither did he find any ganglion cells. Besides the network just mentioned, there exists in the ovarian stroma, and especially in the cortical zone, a plexus very rich in trunks and fibers interlacing in every direction. This plexus penetrates into the albuginea and some parts reach the base of the germinal epithelium, outlining the young follicles and forming a compact network around the adult follicles. The author found fibrillæ even in the granular layer, where they terminate in

cylindrical swellings, but he was not able to prove these to be end-organs.

Liability of Physicians for Want of Skill.—A physician, undertaking the care and treatment of a patient standing in need of his services and employing him, it has become a familiar and well-established principle of law, contracts that he possesses ordinary skill, that he will use ordinary care, and exercise his best judgment in the application of his skill to the case which he undertakes. Nor does this question of his liability depend upon the skill he possesses, but upon the fact whether he has applied that reasonable skill and diligence which is ordinarily used in his profession. Whether he has exercised that skill, or has been guilty of a lack of ordinary care, and want of ordinary skill and attention in any given case, is always a question of fact for the jury. This is the language of the Supreme Judicial Court of Maine in the late case of Cayford v. Wilbur, which was brought to recover damages sustained in consequence of the alleged careless, unskillful, and negligent manner in which a surgeon treated a patient in reducing a fracture of both bones of the latter's leg. A verdict was rendered for $2,075 which this court refuses to set aside. It says that, with the evidence conflicting, it was the province of the jury to decide those controverted questions, and this it had done. Nor were these damages so excessive does the court think, as to justify it in disturbing the verdict on that ground. If the party suing was entitled to recover, then the damages in a case of this nature, and from all the evidence in the case upon that branch of it, it says, did not seem to be excessive. As a general rule, the parties are entitled to the judgment of the jury, and not of the court upon the question. There are cases, to be sure, where the court will intervene; but those cases will be governed by the evidence and circumstances of each particular case. The court will not, however, set verdicts aside on the ground that the damages are excessive or inadequate, unless it is apparent that the jury acted under some bias, prejudice, or improper influence, or have made some mistake of fact or law.

Liability for Sale of Poisons to Minors.—The Supreme Court of Mississippi rendered a decision Oct. 15, 1894, in the case of Meyer v. King, which contains several points of interest. This was an action brought by a father to recover damages from a druggist for the death of his minor son, caused by the latter's taking chloroform sold to him while intoxicated. The minor was one of years of discretion. Because it was not alleged of him that he was inexperienced in the use of chloroform, that there was anything in the character or disposition of the minor that rendered it dangerous to put the chloroform in his hands, or that he was ignorant of its use, it is held that there was no cause of action presented. The death could not, it is said, be connected with the sale, as cause with effect, but it was due to the new one of the minor intervening, and operating as an independent cause to produce it. Moreover, the court holds that a minor old enough to earn, as a clerk in a grocery store, a reasonable and substantial compensation and old enough to be about town drunk,—and that was the case made out here,—was old enough to be chargeable with contributory negligence arising from voluntary intoxication, and that, therefore, the very allegation intended to show a cause of action in this case showed, when taken advantage of, that there was none. The minor, if he had survived, could not, under such circumstances, have maintained a cause of action. The liability of the druggist depended upon the nature and quality of his act in making the sale, as characterized by the circumstances of the sale, as between him and the minor. This act took its quality and color, not only from what he did in making the sale, but from the presence or absence on the minor's part of such contributory negligence, in his conduct at the time as would bar him had he lived and sued. The presence of such contributory negligence, if it existed, was an essential part of the legal quality of the act as imposing liability as between the minor and the druggist, and it was only where he, had he survived, could have sued, that the father, after his death, could. Finally, the court decides that he who violates Section 1,592 of the Code, which forbids the sale of poisons to minors, is punishable for such crime by fine and imprisonment under Section 1,454, Code 1892, and is civilly guilty of negligence. But whether such negligent act makes him liable for the special damage sustained depends upon whether it is the proximate cause of the injury.

Abandonment of Newport Barracks, Ky.—In looking over the available material for a few remarks in the way of good-bye to the now abandoned military post of Newport Barracks, Ky., one is struck by an amusing illustration of heredity in the army medical officer. The surgeon of the United States Army was so accustomed to be stationed on the outskirts of settlement and civilization that every remark made by him concerning the climate, fauna, flora, etc., of his station was accepted as an addition to our knowledge of the hitherto unknown. The army medical officer came, therefore, to feel that it was his bounden duty to report on these subjects wherever he was stationed. In this way we find an explanation of the fact that in an official report of the conditions at Newport Barracks, published in 1870, it is gravely announced in relation to two or three hundred men stationed at the post: That the climate may be classed among the temperate and that the seasons are tolerably well defined; the seasons change by quite a regular gradation, etc. . . . "The geologic formation at this post is that of the lowest silurian; the blue limestone containing the trilobite and other characteristic organic remains of this period is about sixty feet below the surface and is covered by alluvium, sand and gravel. The primitive forest growth in the neighboring country is beech, walnut, hickory, sugar tree, white oak," etc. All this while there are more than a quarter of a million people living in the cities surrounding and swamping the few soldiers in whose interest the report was written.

From the status of a military post for defensive and offensive warfare, Newport Barracks became at one time a depot for recruits and at another an arsenal. For some years past it has been garrisoned by only a few men, the post of Fort Thomas, Ky., having taken its place. A commodious and well appointed brick hospital was built in 1874; but on account of the probable abandonment of the post it has not been kept in repair, and indeed, of late it has practically been unoccupied. The barracks were three-story brick buildings, the lower floors occupied as kitchens and messrooms, the upper as dormitories. The officers' quarters were of brick, facing the Ohio River. Most of the buildings were old and in bad repair. Water was supplied by connection with the Newport waterworks. The prevailing diseases were intermittents, diarrheal and venereal diseases.

Drunkenness as an Excuse for Crime under the New York Penal Code.—At common law, drunkenness was not only an excuse for crime, but evidence of intoxication, while admissible, and to be considered in some cases, was yet generally of no avail. If a man made himself voluntarily drunk, it was no excuse for any crime he might commit while he was so, and he had to take the responsibility of his own voluntary act. If the assault were unprovoked, the fact of intoxication would not be allowed to affect the legal character of the crime. The fact of intoxication was not permitted to be even considered by the jury upon the question of premeditation.

The strict rule of the common law has, however, been slightly relaxed by the New York penal code, which provides that "No act committed by a person while in a state of voluntary intoxication shall be deemed less criminal by reason of his having been in such condition. But whenever the actual existence of any particular purpose, motive or intent is a necessary element to constitute a particular spe-

cies or degree of crime, the jury may take into consideration the fact that the accused was intoxicated at the time, in determining the purpose, motive or intent with which he committed the act."

Under this provision it has been held that it is not proper to charge the jury that the mere fact of intoxication is necessarily evidence even tending to show an absence of premeditation and deliberation. Such fact might tend in some cases to show absence, while in others it might not. It is simply the duty of the judge to leave it to the jury to take into consideration the question of intoxication determining the motive or intent of the accused, and whether he acted with deliberation and premeditation.

These remarks are made by the Court of Appeals of New York in the case of People v. Leonardi, decided Oct. 23, 1894, where it goes on to say that it does not think that under this statute the intoxication need be to such an extent as to necessarily and actually preclude the defendant from an intent, or from being actuated by a motive, before the jury would have a right to regard it as having any legal effect upon the character of his act.

Any intoxication may be considered by the jury, and the decision as to its effect rests with them. But that a man may be even grossly intoxicated, and yet be capable of forming an intent to kill or do any other criminal act, is indisputable; and if, while so intoxicated, he forms an intent to kill, and carries it out with premeditation and deliberation, he is without doubt guilty of murder in the first degree.

If, however, by reason of intoxication, the jury should be of opinion that the deliberation or premeditation necessary to constitute murder in the first degree did not exist, the crime is reduced to a lower grade of murder, or in the absence of any intent to kill, then to manslaughter in some of its grades. The intoxication need not be to the extent of depriving the accused of all power of volition, or of all ability to form an intent.

Recovery from Employers.—The question is constantly becoming a more and more important one to physicians as to the liability of an employer for medical services rendered to an injured employe. Several points of interest in this connection are made in a case where an employe met with an accident by which his ankle was fractured. A physician was called to his assistance by parties not connected with the company for which he worked. The doctor set the ankle, and gave such other assistance and attention as was necessary. He made charges for such services, in his book, against the patient, but sued the latter's employer for his surgical and medical attendance. He asserted that, two or three days after he had set the ankle, he met the general managing agent of the company, when a conversation occurred in which the agent said: "Take care of Jim. We intend to see the boy through," although the agent denied recollection of such a conversation. After the evidence was in, the company asked for an instruction to the effect that the physician was not entitled to recover for services rendered before the time of the alleged conversation. This the court refused to give, and gave nothing equivalent in the general charge. The court charged the jury, in effect, that, if the jury believed that the conversation occurred, the physician might recover his entire bill and there was a verdict for the amount of the entire bill. But on appeal to it, the Supreme Court of Wisconsin reverses the judgment of the lower court and holds (Malone v. Knickerbocker Ice Co., decided Nov. 13, 1894) that the instruction requested, or its equivalent, should have been given. It says that the employer was not liable to the physician for the services which he rendered unless it had employed him to render the services. It was not asserted that it had employed him prior to the alleged conversation, nor otherwise than by that conversation. A considerable part of the services—more than one-third of the entire bill—was rendered before the time of that conversation. If the company was liable at all, it was by reason of that conversation. Up to that time the debt was the debt of the patient, and was charged to him. If it ever became the debt of the company, it was because the words of the agent could be construed to be a promise of the company to pay it. The words alleged to have been used were not an unequivocal promise to pay for any part of the services, but they possibly might be construed to be such a promise; but, as to that part of the services rendered before that time, they could hardly be held to be a valid promise, in view of the statute of frauds, which provides that every special promise to answer for the debt, default, or miscarriage of another person shall be void unless it be in writing. It could be good by way of ratification only when it should appear that the services had really been rendered upon the employer's credit, and that its agent knew that fact at the time of making the promise.

Abandonment of Fort Ontario, N. Y.—Fort Ontario, from its position on the lake at the mouth of the Oswego River, has more of a military history than the recently abandoned posts in the West. A fort was built in this location in 1722 to protect trade with the Six Nations; but on the outbreak of war between the French and English in 1744 the traders abandoned the position. It remained unoccupied until 1755 when it became the base of supplies and point of rendezvous for an English attack on Fort Niagara. The troops while delayed at the rendezvous during the winter built a log fort, which was called Fort Ontario, to command the harbor. It consisted of a stockade twenty to thirty inches thick around a space 200 feet square. The wall, fourteen feet high, was surrounded by a ditch fourteen feet wide by ten feet deep. The excavated earth was thrown up *en glacis* on the counterscarp with a steep slope over the covered way and a scaffolding extending all around within to permit the garrison to fire from above. The French, however, anticipated the English attack. Instead of waiting to defend Fort Niagara they attacked the English at Ontario. The celebrated Montcalm, who afterward fell in defending Quebec, left Fort Frontenac with 3,000 troops, French, Canadians and Indians, and landing near Oswego, opened so destructive an artillery fire on Fort Ontario that the garrison abandoned the position and retreated across the river to Fort Oswego, a recently built fort of similar construction. The French lost no time in crossing the river and opened on the enemy next morning. Colonel Mercer, the English commander was killed and the garrison surrendered. The French, with a loss of 30 killed and wounded, captured 1,700 prisoners, 120 pieces of artillery, 9 vessels of war in process of construction for operations against Fort Niagara and an immense quantity of munitions of war and provisions. Before the surrender Montcalm gave assurance of protection from barbarous treatment by his Indian allies; but many of the unfortunate prisoners were put to the torture and massacred. Montcalm dismantled the forts and withdrew with his captures to Niagara. Four years later a large force was aggregated at Fort Ontario under General Amherst for the invasion of Canada and thereafter, until transferred to the United States in 1796, the fort was garrisoned by English troops. In 1783 Colonel Willet made an attempt to surprise and capture the position; but his march and its object having been discovered, he retreated without making an attack. The last episode in the war history of this post occurred in 1814, when its small garrison withdrew under the pressure of a heavy force landed from a fleet of English war vessels. The post now abandoned is a pentagon of sandstone and limestone, capped with dressed limestone, casemated, fortified with ramparts and, like the old log fort, surrounded by a dry ditch, *glacis* and covered ways. Within the walls is a comfortable two-story barrack, erected in 1842, of sandstone with limestone sills and caps. Four sets of officers' quarters were very comfortably fitted. The hospital was outside the fortification, a two-story administration building and two small wards, one of six, the other of four beds; but the latter was used mostly as a recreation room. The water supply was derived from the city mains and the sewerage system was in efficient condition. A few years ago the post was temporarily abandoned and permission was given the railroad companies to run tracks through the reservation. These tracks greatly obstructed the only avenue to the post; and the hospital became hemmed in between two lines of rail with continuous traffic on each. Long ago the post was established for the protection of trade. Now, the period of its usefulness has passed and its site will probably soon be given up wholly to trade and traffic.

Philadelphia Notes.

BOARD OF PUBLIC CHARITIES AND CORRECTION.—The recent action of the Board of Public Charities and Correction in dropping Dr. Daland from the medical staff of the Philadelphia Hospital without notice, and electing Dr. H. A. Hare in his place, has raised quite a storm of criticism, and Dr. Hare has written a letter to the Board, declining to accept the position under the circumstances. It appears that while Dr. Daland was making some investigations into the blood changes in malarial fever, he withheld quinin for a time from the treatment and gave tincture of nux vomica as a placebo. The Board not being especially interested in the life history of the *plasmodium malariæ*, concluded that the patients were neglected or not properly treated. It is evident that there are two sides to the question, although the medical men and medical journals are strong in their support of Dr. Daland, who probably will be reinstated at the next meeting of the Board.

THE WEATHER has been almost as mild as June during the week preceding Christmas. The city, generally, is healthy in spite of the presence of some sporadic cases of smallpox and diphtheria. It is surprising that with regard to smallpox, not a single case has originated in the slum districts and the few reported cases are promptly removed to the Municipal Hospital and the premises disinfected and quarantined. By using the same precautions in cases of diphtheria, the decrease has been kept within bounds and the slight epidemic is decreasing. The general report among physicians is that the city is distressingly healthy; occasionally, however, a case occurs which shows that influenza has not yet entirely loosened its grip upon the community.

COLLEGE OF PHYSICIANS.—On December 14, Dr. Wm. S. Halsted, of Baltimore, and Dr. Wm. B. Coley, of New York, by invitation, read papers before the Section on Surgery of the College of Physicians, on the "Radical Treatment of Hernia," which elicited a valuable discussion. The guests of the Section were entertained at dinner by the President, Dr. John B. Roberts, at his residence.

Louisville Notes.

DR. BARBOUR.—Dr. Barbour, Superintendent of the Louisville City Hospital, has returned from a two weeks' sojourn in Georgia, much benefited by his trip.

FALLS CITY MEDICAL SOCIETY.—This society met with Dr. W.T. Boggess on the 20th inst., the paper of the evening being read by Dr. Boggess; title "Therapeutic Hints."

CITY HOSPITAL.—A patient was recently admitted to the City Hospital with diphtheria, the condition not being recognized until the following morning. After being isolated, the special nurse on duty with the case contracted diphtheria; her roommate from her and afterward a third nurse contracted it. The cases are thought to be mild.

KENTUCKY SCHOOL OF MEDICINE AND HOSPITAL.—Invitations were issued to the profession of the city to a reception given by the Faculty of this institution in honor of the opening of the new Hospital, December 23 at 8 P.M. An address of welcome was made by Rev. J. B. Broaddus, in behalf of the trustees, and by Drs. J. B. Marvin, W. H. Wathen, and J. M. Mathews in behalf of the Faculty. Refreshments were served.

MITCHELL DISTRICT MEDICAL SOCIETY (INDIANA.)—This society convened on the 27th inst., at Mitchell. The following gentlemen from this city attended: Dr. J. M. Mathews, H. H. Grant, J. A. Larrabee, L. S. McMurtry, Dudley S. Reynolds. Dr. Mathews delivered the address at the evening session on the 27th inst., on "What are we here for?" This is a prosperous society, its meetings being held twice yearly.

PROF. E. C. DUDLEY.—Prof. E. C. Dudley, of the Chicago Medical College, has been in the city for the last few days, the guest of Dr. Wm. H. Wathen, Dean of the Kentucky School of Medicine. Professor Dudley came to Louisville to secure a much needed rest, but he has fallen into the hands of the Philistines, who see that he does not get what he seeks. On the 21st inst. he was dined at the Kenton Club by Dr. Wathen, where he met a number of Louisville's surgeons and gynecologists.

ACADEMY OF MEDICINE.—The Academy of Medicine was formally organized on Monday the 24th inst. Rooms have been rented and fitted up in the second story of the Fonda Building (and not in the Columbia Building as previously reported), situated on Fourth Avenue, near the U. S. Custom House. The constitution and by-laws, framed after much discussion by the defunct Academy, after being read by Dr. W. L. Rodman, of the committee, were adopted as a whole. By these it is provided that the officers shall be a president, vice-president, secretary and treasurer; that the affairs of the Academy shall be conducted by five trustees, who shall look after the moneys of the Academy, pass upon application for membership, etc. Upon a vote of the Academy the initiation fee was fixed at $5 and the yearly dues $6. There were present thirty-five doctors who signed the constitution, thus becoming charter members, and as many more have expressed themselves as being in sympathy with the movement; so there will probably be a membership of one hundred or more. Among those present at the last meeting were physicians who perhaps have never attended a medical society. The first subject appointed for discussion was "The Vaginal Douche," and Dr. Wm. Bailey was chosen to open the discussion. The question considered by the speaker was "Shall the Antiseptic Vaginal Douche be a Routine in Obstetric Practice?" In regard to the microbic cause of puerperal fever the speaker thought that some may have pyogenic microbes already and a vaginal douche before may prevent the suppurative eye troubles in children; which the statistics of blind asylums show to be the chief cause of blindness among their inmates. If the surroundings are sanitary, the physician and nurse clean, the antiseptics of the proper strength and temperature, and properly administered, the douche can do no harm. The meetings of the Academy will be held on the first and third Mondays of the month from 8 till 10:30 P. M.

THE PUBLIC SERVICE.

Army Changes. Official list of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from Dec. 15, 1894, to Dec. 21, 1894.

Capt. EDWARD R. MORRIS, Asst. Surgeon, on the arrival of Capt. PAUL CLENDENIN, Asst. surgeon, at Ft. Warren, Mass., will be relieved from duty at that post, and will report for duty at Ft. Spokane, Wash.

PROMOTIONS.

To be Asst. Surgeons, with the rank of Captain, after five years' service, in conformity with Act of June 23, 1874:

First Lieut. CHARLES WILLCOX, Asst. Surgeon, Oct. 29, 1894.
First Lieut. HARLAN E. MCVAY, Asst. Surgeon, Oct. 29, 1894.
First Lieut. EUCLID B. FRICK, Asst. Surgeon, Oct. 29, 1894.

LETTERS RECEIVED.

Alma Sanitarium Co., Alma, Mich.; Antikamnia Chemical Co., St. Louis, Mo.; Abbey, C. D., Chicago, Ill.; Adolphus, Philip, Chicago.

Ballou, J. L., Stamford, K.; Blake, Chas. A., West Brookfield, Mass.; Battles, W. S. (2), Shreve, Ohio; Beaty, R. C., Lebanon, Mo.; Brannon, L., Chicago, Ill.; Butterfield, F. A. (2), Rockford, Ill.; Brown, Bedford, Alexandria, Va.

Castle, Wilmot & Co., Rochester, N. Y.; Cram, F. W., Sheldon, Iowa.

Detroit Metric Granule Co. Detroit, Mich.; Dorland, James, Chicago, Ill.; Dougall, F., Brilliant, Ohio; Day, L. T., West Point, Conn.; Darby, Geo. D. B., Philadelphia, Pa.; Davidson, F. B., Fleetville, Pa.; Daggett Table Co., Buffalo, N. Y.; Dana, C. L., New York.

Ewing, J. R., Chicago, Ill.; Elliott, W. S., Woodford, Tenn.; Evinger, Dr., Ferrell, Ill.; Elliott, A. R., New York, N. Y.; Elliott, W. H., Savannah, Ga.; Engelman, Rosa, Chicago.

Finley, R. P., Altoona, Pa.; Fowler, Nath'l C., Jr., Yonkers, N. Y.

Gardiner, Chas., Emporia, Kan.; Greenley, T. W., Trapp, Md.; Green, R., Buffalo, N. Y.; Gould, Geo. M., Philadelphia, Pa.; Garcelon, A., Lewiston, Me.

Hignuth, J. W., Hickman, Del.; Hull, L., Greenwood, La.; Holt, Jno. B., Lockhart, Tex.; Hosack, M. G., Mercer, Pa.; Hansen, C. C., San Francisco, Cal.; Hummel, A. L., Philadelphia, Pa.; Hunt, M. H., Boston, Mass.; Haldenstein, I., New York, N. Y.; Haughton, R. E., Midland, Texas; Henry, F. A., Louisville, Ky.; Haines, W. D., Cincinnati, Ohio.

Jones, Joseph, New Orleans, La.

Knox, C. S., Morris, Ill.; King, Geo. D., New York, N. Y.

Leedom, Chas., Philadelphia, Pa.; Ludwig, H. C., New York, N. Y.; Lambert Pharmacal Co., St. Louis, Mo.; Lentz, Chas. & Sons, Philadelphia, Pa.; Lowe, Geo. N., Randall, Kan.; Lewis, J. G., Cleveland, Ohio.; Love, I. N., St. Louis, Mo.

Montizambert, Toronto, Ont.; Marks, A. A., New York, N. Y.; McClintock, H. M., Hicks, Ala.; Maltine Manufacturing Co., New York, N. Y.; McMurtry, L. S., Louisville, Ky.

New York Post Graduate Medical School, New York, N. Y.

Owen, W. C., St. Louis, Mo.; Oneal, Oren, Wabash, Ind.

Parke, Davis & Co., Detroit, Mich.

Reynders, John & Co., New York, N. Y.; Richer, Hiram & Sons, South Poland, Me.; Ravenscroft, W. H., Oakland, Md.; Rohé, Geo. H., Baltimore, Md.

Shepard, C. H., Brooklyn, N. Y.; Stearnes, F. & Co., Detroit, Mich.; Stewart, F. E., Detroit, U. S. A.; Stearns, Frederick & Co., Detroit; Shoemaker, Jno. V., Philadelphia, Pa.

Thompson, H. H., Munsons, Pa.

Unger, J. W., West Point, Miss.

Von Keller, F. Ph. P., Ardmore, Ind. Ter.

Weston, A. G., New York, N. Y.; Western News Co., Chicago, Ill.; Winn, G. L., Rockford, Ill.; Willing, J. T., Harrisburg, Pa.; Warner, W. R. & Co., Philadelphia, Pa.; Watkins, W. J., Kingwillow, Texas.